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Lehigh University Publication

Vol. 23 MARCH, 1949 No. 1

REGISTER, 1948-1949

ANNOUNCEMENT, 1949-1950

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ASA PACKER
1865

BETHLEHEM, PENNSYLVANIA

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1948

JULY

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1949

JANUARY

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AUGUST

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SEPTEMBER

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NOVEMBER

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DECEMBER

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1950

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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UNIVERSITY CALENDAR

1948-1950

1948

June 30 (Wed.)	Registration for summer half-semester and summer session
July 1 (Thurs.)	Summer half-semester and summer session instruction begins
August 11 (Wed.)	Summer session ends
August 12 (Thurs.)	Post-session begins
August 21 (Sat.)	Last day of classes in summer half-semester
August 23, 24, 25 (Mon.-Wed.)	Summer half-semester examinations
August 28 (Sat.)	Post-session ends
September 20, 21, 22 (Mon.-Wed.)	Registration for fall semester
September 23 (Thurs.)	Fall semester instruction begins
October 10 (Sun.)	Founder's Day
October 30 (Sat.)	Houseparty holiday
November 24, 4:00 P.M. (Wed.)	Thanksgiving vacation begins
November 29, 8:10 A.M. (Mon.)	Thanksgiving vacation ends
December 22, 4:00 P.M. (Wed.)	Christmas vacation begins

1949

January 6, 8:10 A.M. (Thurs.)	Christmas vacation ends
January 22 (Sat.)	Last day of classes in fall semester
January 24 (Mon.)	Examinations begin
February 2 (Wed.)	Examinations end
February 6 (Sun.)	Midyear Commencement
February 7, 8, 9 (Mon.-Wed.)	Registration for spring semester
February 10 (Thurs.)	Spring semester instruction begins
April 2, 12:00 M. (Sat.)	Spring vacation begins
April 4 (Mon.)	Mid-semester reports due
April 11, 8:10 A.M. (Mon.)	Spring vacation ends
May 7 (Sat.)	Houseparty holiday
May 14 (Sat.)	Last day for filing applications for degrees to be conferred on University Day
May 25 (Wed.)	Last day of classes for Arts seniors taking comprehensive examinations
May 28, 30, 31, June 1 (Sat., Mon-Wed.)	Comprehensive examinations for Arts seniors
June 1 (Wed.)	Last day of classes in spring semester
June 3 (Fri.)	Examinations begin
June 14 (Tues.)	Examinations end
June 18 (Sat.)	Class Day and Alumni Day
June 19 (Sun.)	Baccalaureate Sunday
June 20 (Mon.)	University Day
June 27 (Mon.)	Registration for Workshop Workshop instruction begins
June 27, 28 (Mon., Tues.)	Registration for six-week summer session
June 28 (Tues.)	Registration for eight-week summer half-semester
*June 29 (Wed.)	Summer half-semester and summer session instruction begins
*July 4 (Mon.)	Holiday

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* Classes in the six-week session meeting Monday, Tuesday, Thursday, and Friday will meet Wednesday, June 29 instead of Monday, July 4.

UNIVERSITY CALENDAR—Continued

1949

July 5 (Tues.)	Last day on which registration for summer courses will be permitted
July 30 (Sat.)	Workshop ends
August 9 (Tues.)	Six-week summer session ends
August 10 (Wed.)	Post-session begins
August 20 (Sat.)	Last day of classes in eight-week summer half-semester
August 22, 23, 24 (Mon.-Wed.)	Summer half-semester examinations
August 27 (Sat.)	Post-session ends
September 10 (Sat.)	Last day for filing applications for degrees to be conferred on Founder's Day
September 12, 3:00 P.M. (Mon.)	First faculty meeting
September 13 (Tues.)	Freshman week begins
September 13-17 (Tues.-Sat.)	Make-up and special examinations
September 19, 20, 21 (Mon.-Wed.)	Registration for fall semester
September 22 (Thurs.)	Fall semester instruction begins
October 3 (Mon.)	Last day on which registration for fall courses will be permitted
October 9 (Sun.)	Founder's Day
November 17 (Thurs.)	Mid-semester reports due
November 23, 4:00 P.M. (Wed.)	Thanksgiving vacation begins
November 28, 8:10 A.M. (Mon.)	Thanksgiving vacation ends
December 21, 4:00 P.M. (Wed.)	Christmas vacation begins

1950

January 5, 8:10 A.M. (Thurs.)	Christmas vacation ends
January 10 (Tues.)	Last day for filing applications for degrees to be conferred at Midyear Commencement
January 14 (Sat.)	Last day of classes for Arts seniors taking comprehensive examinations
January 18, 19, 20, 21 (Wed.-Sat.)	Comprehensive examinations for Arts seniors
January 21 (Sat.)	Last day of classes in fall semester
January 23 (Mon.)	Examinations begin
February 1 (Wed.)	Examinations end
February 5 (Sun.)	Midyear Commencement
February 6, 7, 8 (Mon.-Wed.)	Registration for spring semester
February 9 (Thurs.)	Spring semester instruction begins
February 20 (Mon.)	Last day on which registration for spring courses will be permitted
April 1, 12:00 M. (Sat.)	Spring vacation begins
April 3 (Mon.)	Mid-semester reports due
April 10, 8:10 A.M.	Spring vacation ends
May 15 (Mon.)	Last day for filing applications for degrees to be conferred on University Day
May 24 (Wed.)	Last day of classes for Arts seniors taking comprehensive examinations
May 27, 29, 30, 31 (Sat., Mon.-Wed.)	Comprehensive examinations for Arts seniors
May 31 (Wed.)	Last day of classes in spring semester
June 2 (Fri.)	Examinations begin
June 13 (Tues.)	Examinations end
June 17 (Sat.)	Class Day and Alumni Day
June 18 (Sun.)	Baccalaureate Sunday
June 19 (Mon.)	University Day

BOARD OF TRUSTEES

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Earle Frederick Johnson, C.E., Eng.D.	Detroit, Mich.
Robert Edwin McMath, A.B., LL.B.	Bethlehem, Pa.
Frank Breckenridge Bell, M.E., Eng.D.	Pittsburgh, Pa.
John Daniel Berg, M.E., Eng.D.	Chatham, Mass.
Andrew Edward Buchanan, Jr., Ch.E.	Wilmington, Del.
Alfred Van Sant Bodine, M.E., Eng.D.	Bridgeport, Conn.
William Lawrence Estes, Jr., B.A., M.D., Sc.D.	Bethlehem, Pa.
Stewart Joseph Cort, El.Met., Eng.D.	Bethlehem, Pa.

Members Elected By Alumni

James Harvey Pierce, E.M., Eng.D.	Scranton, Pa.
Class of 1910	Term Expires 1949
Nevin Elwell Funk, E.E., Eng.D.	Philadelphia, Pa.
Class of 1905	Term Expires 1950
Leonard Mead Horton, B.S. in Bus. Adm.	New York, N. Y.
Class of 1928	Term Expires 1951
Robert Clement Watson, C.E., LL.B.	Washington, D. C.
Class of 1913	Term Expires 1952
Theophil Herbert Mueller, A.B., B.D., M.A., LL.D.	New York, N. Y.
Class of 1914	Term Expires 1953
George Raleigh Brothers, B.A., C.E.	Ware Neck, Va.
Class of 1908	Term Expires 1954

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Secretary and Treasurer
John Irvine Kirkpatrick

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J. D. Berg
A. E. Buchanan, Jr.
Nevin E. Funk

Committee on Buildings and Grounds

Alfred V. Bodine, *Chairman*
T. H. Mueller
Stewart J. Cort

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Nevin E. Funk
Leonard M. Horton

Committee on Endowment

Earle F. Johnson, *Chairman*
J. D. Berg
A. E. Buchanan, Jr.
Alfred V. Bodine
T. H. Mueller
John I. Kirkpatrick, *Secretary*

UNIVERSITY FACULTY

(The first date after the name indicates date of first appointment to continuous service on the faculty; the second date, when the first fails to do so, indicates the date of appointment to present classification as to professional rank.)

MARTIN DEWEY WHITAKER (1946) .... *President*

A.B., Wake Forest, 1927; M.A., North Carolina, 1930; Ph.D., New York University, 1935; LL.D., Lafayette, 1946; Sc.D., Moravian, 1947; Sc.D., Wake Forest, 1947; LL.D., Rutgers, 1948.

EARL KENNETH SMILEY (1934, 1938) .... *Vice-President*

A.B., Bowdoin, 1921; M.A., Lehigh, 1935; L.H.D., Moravian, 1947.

PROFESSORS EMERITUS, ET AL.

FREDERICK RALPH ASHBAUGH (1896, 1946) .... *Bursar Emeritus*

GEORGE CARLTON BECK (1904, 1946) .... *Assistant Professor Emeritus of Quantitative Analysis*

A.C., Lehigh, 1903.

CLAUDE GILLETTE BEARDSLEE (1931, 1947) .... *Professor Emeritus of Moral and Religious Philosophy*

B.A., Yale, 1909; B.D., Hartford Theological Seminary, 1912; S.T.M., 1913; M.A., Southern California, 1922; Ph.D., Brown, 1931.

SYLVANUS A. BECKER (1906, 1944) .... *Associate Professor Emeritus of Civil Engineering*

C.E., Lehigh, 1903; M.S., 1909.

CHARLES CLARENCE BIDWELL (1927, 1947) .... *Professor Emeritus of Physics*

A.B., Rochester, 1904; Ph.D., Cornell, 1914.

RAYMOND COOLEY BULL (1923, 1944) .... *Director Emeritus of the Students' Health Service*

B.S., Colorado College, 1904; A.B., Kansas, 1906; M.D., Jefferson Medical College, 1909.

THOMAS EDWARD BUTTERFIELD (1912, 1944) .... *Professor Emeritus of Heat Power Engineering*

M.E., Stevens Institute of Technology, 1895; C.E., Rensselaer Polytechnic Institute, 1897.

ALPHA ALBERT DIEFENDERFER (1902, 1946) .... *Professor Emeritus of Quantitative Analysis and Assaying*

B.S. in Chem., Lehigh, 1902; M.S., 1908.

AUGUSTUS HENRY FRETZ (1918, 1948) .... *Associate Professor Emeritus of Geology*

Ph.B., Lafayette, 1903; C.E., 1906; M.S., 1924.

ROBERT WILLIAM HALL (1902, 1942) .... *Professor Emeritus of Biology*

Ph.B., Yale, 1895; A.B., Harvard, 1897; M.A., 1898; Ph.D., 1901

PERCY HUGHES (1907, 1942) .... *Professor Emeritus of Philosophy*

A.B., Alfred, 1899; A.M., Columbia, 1902; Ph.D., 1904.

FRED VIALL LARKIN (1912, 1948) .... *Professor Emeritus of Mechanical Engineering*

B.S., Wisconsin, 1906; M.E., 1915; Eng.D., Stevens Institute of Technology, 1948.

JOHN HUTCHESON OGBURN (1895, 1939)................*Professor Emeritus of Mathematics and Astronomy*
C.E., Vanderbilt, 1892.

HOWARD ROLAND REITER (1911, 1941)....................*Professor Emeritus of Physical Education*
A.B., Princeton, 1898; M.A., 1900.

JOSEPH BENSON REYNOLDS (1907, 1948)..................*Professor Emeritus of Mathematics and Theoretical Mechanics*
B.A., Lehigh, 1907; M.A., 1910; Ph.D., Moravian, 1919.

BRADLEY STOUGHTON (1923, 1944)........*Professor Emeritus of Metallurgy*
Ph.B., Yale, 1893; B.S., Massachusetts Institute of Technology, 1896; Eng.D., Lehigh, 1944.

PROFESSORS

WILLIAM APPLETON AIKEN (1941, 1948)....................*Professor of History*
B.A., Yale, 1929; M.Litt., Cambridge, 1932; Ph.D., Yale, 1939.

CARL ELMER ALLEN (1930, 1945)........................*Professor of Accounting, Acting Director of the Curriculum in Business Administration*
B.S., Illinois, 1923; M.S., 1925; Ph.D., 1930; C.P.A., Pennsylvania, 1939.

EDWARD DELBERT AMSTUTZ (1938, 1947)...............*Professor of Organic Chemistry*
B.S., College of Wooster, 1930; M.S., Institute of Paper Chemistry, 1932; Ph.D., Cornell, 1936.

HAROLD VICTOR ANDERSON (1918, 1941)................*Professor of Chemistry*
B.Ch.E., Michigan, 1912; M.S., Lehigh, 1925.

ALLEN JENNINGS BARTHOLD (1939)......*Professor of Romance Languages, Head of the Department of Romance Languages*
B.A., Lehigh, 1921; Ph.D., Yale, 1931.

ARTHUR CROCKER BATES (1941, 1948)...............*Professor of Mechanical Engineering*
B.S., Purdue, 1929; M.S., Michigan, 1933; Ph.D., Pennsylvania, 1941.

PAUL LEVERNE BAYLEY (1927, 1937)........................*Professor of Physics*
B.A., Arkansas, 1913; M.A., Illinois, 1914; Ph.D., Cornell, 1923.

JACOB LYNFORD BEAVER (1917, 1931)..................*Professor of Electrical Engineering*
E.E., Lehigh, 1904; M.S., 1921; Sc.D., Harvard, 1932.

LEWIS WHITE BECK (1948)....................................*Professor of Philosophy*
A.B., Emory, 1934; M.A., Duke, 1935; Ph.D., 1937.

LOYAL VIVIAN BEWLEY (1940)...........*Professor of Electrical Engineering, Head of the Department of Electrical Engineering, Director of the Curriculum in Electrical Engineering*
B.S. in E.E., Washington, 1923; M.S., Union, 1928.

FREDERICK ALDEN BRADFORD (1926, 1935)...........*Professor of Economics, Head of the Department of Finance*
A.B., Michigan, 1921; M.A., 1923; Ph.D., 1926.

ELMER CLARK BRATT (1929, 1941)........................*Professor of Economics*
A.B., Nebraska, 1925; A.M., 1926; Ph.D., Wisconsin, 1935.

ALLISON BUTTS (1916, 1938)....................*Professor of Electrometallurgy*
A.B., Princeton, 1911; B.S., Massachusetts Institute of Technology, 1913.

ALFRED COPELAND CALLEN (1939)...... *Professor of Mining Engineering, Head of the Department of Mining Engineering, Director of the Curriculum in Mining Engineering*
E.M., Lehigh, 1909; M.S., 1911.

*NEIL CAROTHERS (1923)....................*Macfarlane Professor of Economics, Dean of the College of Business Administration*
B.A., Arkansas, 1905; Dip. in Econ., Oxford, 1907; Ph.D., Princeton, 1916.

WRAY HOLLOWELL CONGDON (1934, 1938)..........*Professor of Education, Dean of Students, Director of Admissions, Director of Personnel Services*
A.B., Syracuse, 1914; M.A. (Engl.), 1915; M.A. (Ed.), Michigan, 1922; Ph.D., 1929.

ROY BURFORD COWIN (1924)........*Professor of Accounting, Head of the Department of Accounting*
A.B., Michigan, 1916; M.A., 1918.

EARL LEVERNE CRUM (1929, 1941)..............................*Professor of Greek, Head of the Department of Greek*
A.B., St. John's (Annapolis), 1913; A.M., Johns Hopkins, 1916; Ph.D., New York, 1924.

CASSIUS WILD CURTIS (1946, 1948)...........................*Professor of Physics*
A.B., Williams, 1928; Ph.D., Princeton, 1936.

GEORGE BARTLETT CURTIS (1920, 1928)...........*Registrar and University Editor*
A.B., Wesleyan, 1916; A.M., Columbia, 1923.

HERBERT MAYNARD DIAMOND (1927)...............*Professor of Economics, Head of the Department of Economics and Sociology*
B.A., Yale, 1914; Ph.D., 1917.

GILBERT EVERETT DOAN (1926, 1937)................*Professor of Metallurgy, Head of the Department of Metallurgical Engineering, Director of the Curriculum in Metallurgical Engineering*
Ch.E., Lehigh, 1919; Ph.D., Berlin, 1926.

WILLIAM JOSEPH ENEY (1936, 1946)........*Professor of Civil Engineering, Head of the Department of Civil Engineering and the Fritz Engineering Laboratory, Director of the Curriculum in Civil Engineering*
B.E., Johns Hopkins, 1927; M.S., Lehigh, 1938.

WARREN WALTER EWING (1920, 1937)....*Professor of Physical Chemistry*
B.S., Parsons, 1912; M.S., Chicago, 1918; Ph.D., 1920.

ADELBERT FORD (1931)...*Professor of Psychology, Head of the Department of Psychology*
A.B., Michigan, 1920; A.M., 1923; Ph.D., 1926.

WILSON LEON GODSHALL (1939, 1947)...........*Professor of International Relations, Head of the Department of International Relations*
B.S., Pennsylvania, 1919; A.M., 1920; Ph.D., 1923.

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*Absent on leave 1948-1949.

George Dewey Harmon (1925, 1942)................*Professor of American History, Head of the Department of History and Government*

B.A., Duke, 1921; M.A., 1922; Ph.D., Pennsylvania, 1930.

Thomas Huger Hazlehurst (1927, 1945)..........*Professor of Chemistry*

A.B., Charleston, 1923; Ph.D., Johns Hopkins, 1927.

Garth Ahyman Howland (1927, 1946)................*Professor of Fine Arts, Head of the Department of Fine Arts*

B.A., North Dakota, 1912; M.A., Harvard, 1930.

William Leroy Jenkins (1934, 1947)...............*Professor of Psychology*

B.S. in Chem., Brooklyn Polytechnic Institute, 1921; M.A., Michigan, 1932; Ph.D., 1936.

Cyril Dewey Jensen (1925, 1945)..........*Professor of Civil Engineering*

B.S. in C.E., Minnesota, 1921; M.S., Lehigh, 1929; C.E., Minnesota, 1930.

Bruce Gilbert Johnston (1938, 1945)........................*Professor of Civil Engineering, Director of the Fritz Engineering Laboratory*

B.S. in C.E., Illinois, 1930; M.S., Lehigh, 1934; Ph.D., Columbia, 1938.

Carl Otto Keck (1944)............*Director of the Students' Health Service*

M.D., Hahnemann Medical College, 1937.

Arthur Warner Klein (1904, 1915)................*Professor of Mechanical Engineering*

M.E., Lehigh, 1899.

†Howard Seavoy Leach (1924)..*Librarian*

A.B., Wesleyan, 1913; M.A., Princeton, 1915.

James Sawyer Luckett (1946)..........*Professor of Military Science and Tactics, Head of the Department of Military Science and Tactics*

B.S., U. S. Military Academy, 1930; M.S., Massachusetts Institute of Technology, 1940; Col., Inf., U. S. A.

Darrell Eugene Mack (1941, 1948)..*Professor of Chemical Engineering*

B.S. in Ch.E., Purdue, 1934; M.S., Niagara, 1939; Ph.D., Purdue, 1941.

Archie Roscoe Miller (1922, 1946)......................*Professor of Electrical Engineering*

B.S. in E.E., Illinois, 1918; M.S., Lehigh, 1925.

Robert Pattison More (1916, 1942)..................*Professor of German, Head of the Department of German, Executive Secretary of the Graduate Faculty*

B.A., Lehigh, 1910; M.A., Harvard, 1913.

Frank Evans Myers (1946).......................................*Professor of Physics, Head of the Department of Physics, Director of the Curriculum in Engineering Physics*

B.A., Reed, 1927; M.S., New York University, 1930; Ph.D., 1934.

Harvey Alexander Neville (1927, 1938)........*Professor of Chemistry and Chemical Engineering, Head of the Department of Chemistry Chemical Engineering, Director of the Curricula in Chemistry and Chemical Engineering, Director of the Lehigh Institute of Research*

A.B., Randolph-Macon, 1918; M.A., Princeton, 1920; Ph.D., 1921.

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†Died November 17, 1948.

Philip Mason Palmer (1902, 1906)........................*Professor of German, Dean of the College of Arts and Science*

A.B., Bowdoin, 1900; A.B., Harvard, 1902; Dr.h.c., Padua, 1922; Litt.D., Moravian, 1941.

Arthur Everett Pitcher (1938, 1948).........*Professor of Mathematics*

A.B., Western Reserve, 1932; A.M., Harvard, 1933; Ph.D., 1935.

George Emil Raynor (1931, 1946)..................*Professor of Mathematics, Head of the Department of Mathematics and Astronomy*

B.S., Washington, 1918; M.A., Princeton, 1920; Ph.D., 1923.

Percy Lee Sadler (1946)........*Professor of Physical Education, Director of the Division of Athletics and Physical Education*

Col., Inf., U. S. A., Ret.

Ernst Bernhard Schulz (1927, 1946)......*Professor of Political Science*

B.S., Michigan, 1920; M.A., 1921; Ph.D., 1927.

Earl James Serfass (1936, 1946)............................*Professor of Chemistry*

B.S. in Ch.E., Lehigh, 1933; M.S., 1935; Ph.D., 1938.

Jonathan Burke Severs (1927, 1941)......................*Professor of English*

A.B., Rutgers, 1925; A.M., Princeton, 1927; Ph.D., Yale, 1935.

Clarence Albert Shook (1930, 1946)............ *Professor of Mathematics*

A.B., Western Reserve, 1916; A.M., Harvard, 1918; Ph.D., Johns Hopkins, 1928.

Charles Wellington Simmons (1928, 1940)........*Professor of Chemical Engineering*

B.Sc., Queens (Ontario), 1920; M.S., Lehigh, 1928.

Lloyd LeRoy Smail (1926, 1929)......................*Professor of Mathematics*

A.B., University of Washington, 1911; A.M., 1912; Ph.D., Columbia, 1913.

Robert Metcalf Smith (1925).................................*Professor of English, Head of the Department of English*

A.B., Amherst, 1908; A.M., Columbia, 1909; Ph.D., 1915.

Milton Caleb Stuart (1926)..........*Professor of Mechanical Engineering, Acting Head of the Department of Mechanical and Industrial Engineering, Acting Director of the Curricula in Mechanical and Industrial Engineering*

B.S. in M.E., Pennsylvania, 1909; M.E., 1924.

Hale Sutherland (1930).........................*Professor of Civil Engineering*

A.B., Harvard, 1906; S.B., Massachusetts Institute of Technology, 1911.

Harold Prescott Thomas (1932)......................*Professor of Education, Head of the Department of Education, Director of the General College Division, Director of the Summer Session, Director of the Adult Education Program*

B.S., Colgate, 1920; Ed.M., Harvard, 1925; Ed.D., 1932.

Stanley Judson Thomas (1923, 1928)..........*Professor of Bacteriology, Head of the Department of Biology*

B.S., Lafayette, 1912; M.S., Lehigh, 1913; M.A., 1915; Ph.D., Pennsylvania, 1928.

BRADFORD WILLARD (1939)......................................*Professor of Geology, Head of the Department of Geology*

B.A., Lehigh, 1921; A.M., Harvard, 1922; Ph.D., 1932.

HORACE WETHERILL WRIGHT (1921, 1923)................*Professor of Latin, Head of the Department of Latin*

A.B., Wisconsin, 1908; Ph.D., Pennsylvania, 1917.

ASSOCIATE PROFESSORS

WALTER BECK (1947)............................*Associate Professor of Metallurgy*

Ph.D., Berlin, 1925.

FRANK CHESTER BECKER (1927, 1942)....*Stewardson Associate Professor of Philosophy, Chairman of the Department of Philosophy*

A.B., Wesleyan, 1905.

FERDINAND PIERRE BEER (1947, 1948)... *Associate Professor of Mechanics*

B.S., Geneva (Switzerland), 1933; M.A., 1935; Ph.D., 1937; M.A., Paris, 1938.

ROBERT DOMINICK BILLINGER (1929, 1939)............*Associate Professor of Chemistry*

Ch.E., Lehigh, 1921; M.S., 1925; Ph.D., Cincinnati, 1929.

ROBERT ALLEN BREAM (1947)................*Associate Professor of Education*

B.S., Gettysburg, 1929; M.A., Columbia, 1933; Ed.D., Pennsylvania State, 1943.

ELLIOTT WARD CHENEY (1942)...... ....*Associate Professor of Physics*

A.B., Dartmouth, 1920; M.S., Brown, 1925; Ph.D., Princeton, 1929.

GLENN JAMES CHRISTENSEN (1939, 1946) *Associate Professor of English*

B.A., College of Wooster, 1935; Ph.D., Yale, 1939.

EDWARD HUTCHINS CUTLER (1930, 1947)..............*Associate Professor of Mathematics*

A.B., Harvard, 1925; A.M., 1926; Ph.D., 1930.

HARRY BARRETT DAVIS (1946)...................*Associate Professor of English*

B.L.I., Emerson, 1929.

BELA KALMAN ERDOSS (1944, 1946).................*Associate Professor of and Research Associate in Mechanical and Industrial Engineering*

M.E., Royal Joseph University of Technical Science, 1937; Ph.D., Lehigh, 1944.

S. BLAINE EWING (1946, 1947)....................*Associate Professor of English*

A.B., Princeton, 1927; M.A., 1928; Ph.D., 1934.

FRANK JUNIOR FORNOFF (1940, 1947)......................*Associate Professor of Chemistry*

A.B., Illinois, 1936; M.S., Ohio State, 1937; Ph.D., 1939.

MERTON OTIS FULLER (1912, 1922)..............*Associate Professor of Civil Engineering*

C.E., Syracuse, 1910; M.S., Lehigh, 1934.

ROBERT TAYLOR GALLAGHER (1942, 1945)..............*Associate Professor of Mining Engineering*

B.S., Pennsylvania State, 1927; M.A., Missouri, 1938; D.E.M., Colorado School of Mines, 1941.

HUGH RICHARD GAULT (1946, 1948)..........*Associate Professor of Geology*

A.B., DePauw, 1936; M.A., Missouri, 1938; Ph.D., Johns Hopkins, 1942.

JAMES LARMOUR GRAHAM (1930, 1938)................*Associate Professor of Psychology*
B.A., Muskingum, 1911; B.D., Union Theological Seminary, 1922; M.A., Columbia, 1922; Ph.D., Peabody, 1927.

HOWARD DIETRICH GRUBER (1914, 1948)............*Associate Professor of Electrical Engineering*
E.E., Lehigh, 1909; M.S., 1923.

JAMES BUSSE HARTMAN (1945, 1948).....................*Associate Professor of Mechanical Engineering*
B.S. in M.E., Lehigh, 1931; M.S., 1932; Ph.D., 1947.

BYRON CROMWELL HAYES (1941, 1947)...................*Associate Director of Admissions*
B.E., Illinois State Teachers College, 1935; M.A., Chicago, 1938.

THOMAS TIMINGS HOLME (1937, 1946)................*Associate Professor of Mechanical Engineering*
B.S. in M.E., Lehigh, 1935; M.S., 1940; I.E., 1948.

HERVEY DEVOLZO HOTCHKISS (1946).....................*Associate Professor of Economics*
B.S. in Bus. Adm., Buffalo, 1934; M.A., Cornell, 1936.

JAMES MEAD HYATT (1946).........................*Associate Professor of Physics*
A.B., Cornell, 1918; Ph.D., 1922.

THOMAS EDGAR JACKSON (1937, 1946).....................*Associate Professor of Mechanical Engineering*
B.S. in M.E., Carnegie Institute of Technology, 1934; M.S., Lehigh, 1937.

JOHN EDWARD JACOBI (1948).................*Associate Professor of Sociology*
B.A., Lehigh, 1929; Ph.D., New York University, 1933.

FINN BJORN JENSEN (1947).................*Associate Professor of Economics*
A.B., Southern California, 1934; M.A., 1935; Ph.D., 1940.

KENNETH WORCESTER LAMSON (1926, 1930)..........*Associate Professor of Mathematics*
A.B., Harvard, 1906; Ph.D., Chicago, 1917.

VORIS V. LATSHAW (1931, 1947)........*Associate Professor of Mathematics*
B.A., Indiana, 1927; A.M., 1928; Ph.D., 1930.

JOHN DOUGLAS LEITH (1945, 1947)............*Associate Dean of Students*
A.B., North Dakota, 1920; A.M., Columbia, 1924.

DOUGLAS EWART MODE (1940, 1946)......*Associate Professor of Electrical Engineering*
B.S. in E.E., Pennsylvania, 1935; M.S. in E.E., 1940; Ph.D., 1947.

BRADFORD BRECKENRIDGE OWEN (1945, 1948)........*Associate Professor of Biology*
B.A., Williams, 1934; M.A., 1936; Ph.D., Harvard, 1940.

BASIL WALDO PARKER (1940, 1946)..........*Associate Professor of Biology*
S.B., Massachusetts Institute of Technology, 1933; A.M., Harvard, 1935; Ph.D., Massachusetts Institute of Technology, 1939.

HARRY GORDON PAYROW (1916, 1942)......*Associate Professor of Sanitary Engineering*
B.S. in C.E., Tufts, 1907.

MAURICE JOHN QUINLAN (1945, 1948) .....*Associate Professor of English*
B.A., Yale, 1926; M.A., Columbia, 1929; Ph.D., 1941.

EDGAR HEISLER RILEY (1926, 1931)............*Associate Professor of English*
A.B., Cornell, 1915; Ph.D., 1925.

RAYMOND BURKERT SAWYER (1946)..........*Associate Professor of Physics*
Ph.B., Ripon, 1921; M.S., Wisconsin, 1925; Ph.D., Chicago, 1930.

CHARLES AUGUSTUS SEIDLE (1948)................*Associate Dean of Students*
B.A., Pittsburgh, 1931; M.A., Columbia, 1936; Ed.D., 1948.

JUDSON GRAY SMULL (1919, 1947)......*Associate Professor of Chemistry*
B.S. in Chem., Lehigh, 1906; M.S., 1921.

RAFAEL ARCHANGEL SOTO (1925, 1943)..................*Associate Professor of Romance Languages*
B.S., Illinois, 1912; B.A., 1915; M.A., 1917.

ROBERT ROTH STOLL (1946, 1947)......*Associate Professor of Mathematics*
B.S. in Phys. and Eng., Pittsburgh, 1936; M.S., 1937; Ph.D., Yale, 1942.

ROBERT DANIEL STOUT (1939, 1946).........................*Associate Professor of Metallurgical Engineering*
B.S., Pennsylvania State, 1935; M.S., Lehigh, 1941; Ph.D., 1944.

CARL FERDINAND STRAUCH (1938, 1946)....*Associate Professor of English*
A.B., Muhlenberg, 1930; M.A., Lehigh, 1934; Ph.D., Yale, 1946.

FRANCIS JOHN TREMBLEY (1928, 1941)......*Associate Professor of Biology*
B.S., Hobart, 1928; M.S., Lehigh, 1931; Ph.D., Pennsylvania, 1940.

AMBROSE RANDALL WEST (1948)....................*Associate Professor of Civil Engineering*
B.S. in C.E., Pennsylvania State, 1926.

LAWRENCE WHITCOMB (1930, 1939)........*Associate Professor of Geology*
Ph.B., Brown, 1922; A.M., Princeton, 1928; Ph.D., 1930.

ALBERT CHARLES ZETTLEMOYER (1941, 1946)........*Associate Professor of Chemistry*
B.S. in Ch.E., Lehigh, 1936; M.S., 1938; Ph.D., Massachusetts Institute of Technology, 1940.

ASSISTANT PROFESSORS

RAY LIVINGSTON ARMSTRONG (1946)........*Assistant Professor of English*
B.A., Williams, 1930; B.A., Oxford, 1932; M.A., 1936; Ph.D., Columbia, 1941.

FAY CONANT BARTLETT (1917, 1921)........*Assistant Professor of Physical Education, Assistant Director of Physical Education*

PAUL FRANKLIN BARTUNEK (1946)........... *Assistant Professor of Physics*
B.S. in Eng. and Phys., Nebraska, 1930; M.S., 1932; Ph.D., Michigan, 1935.

BENJAMIN DEWITT BEACH (1947)...........*Assistant Professor of Military Science and Tactics*
B.S. in E.E., Lehigh, 1933; Lt. Col., Ord., U. S. A.

FRANK SWAN BEALE (1930, 1935)......*Assistant Professor of Mathematics*
B.S., Maine, 1921; M.S., 1923; Ph.D., Michigan, 1931.

GEORGE MARTIN BEAN (1946)...................*Assistant Professor of Religion, Chaplain of the University*
B.S., Virginia, 1939; B.D., Virginia Theological Seminary, 1942.

ELBERT FRANCIS CARAWAY (1941, 1946) *Assistant Professor of Physical Education, Assistant Director of Athletics, Coach of Baseball*
B.S., Purdue, 1930.

JOHN OLSON CHELLEVOLD (1946)......*Assistant Professor of Mathematics*
A.B., St. Olaf, 1927; M.A., Northwestern, 1929.

JACK ELI COLE (1948)..........*Assistant Director of the Students' Health Service*
B.S., Pennsylvania State, 1937; M.D., Pennsylvania, 1941.

RAYMOND GIBSON COWHERD (1946)..........*Assistant Professor of History*
A.B., William Jewell, 1933; M.A., Pennsylvania, 1936; Ph.D., 1940.

VINCENT FREDERICK COWLING (1946)..........*Assistant Professor of Mathematics*
B.A., Rice Institute, 1940; M.A., 1942; Ph.D., 1944.

RICHARD MALONE DAVIS (1941, 1947)... *Assistant Professor of Economics*
A.B., Colgate, 1939; M.A., Cornell, 1941.

WILLIS LYLE DONALDSON (1946)..........*Assistant Professor of Electrical Engineering*
B.S. in E.E., Texas Technological College, 1938.

AURIE NICHOLS DUNLAP (1948)........*Assistant Professor of International Relations*
A.B., Union (New York), 1929; A.M., Columbia, 1931.

NELSON ROY EASTON (1947)..........*Assistant Professor of Chemistry*
A.B., Middlebury, 1941; Ph.D., Illinois, 1946.

RAYMOND JAY EMRICH (1946)..........*Assistant Professor of Physics*
B.S., Princeton, 1938; Ph.D., 1946.

JACK EMRICK (1948)..........*Assistant Professor of Military Science and Tactics*
Capt., U. S. A.

EPHRAIM BRYSON EVERITT (1948).......... *Assistant Professor of English*
B.A., Pennsylvania State, 1925; M.A., 1928.

GEORGE DORMER FARNÉ (1934, 1945)......*Assistant Professor of Romance Languages*
A.B., Columbia, 1926; M.A., 1927.

VELMER BERNEL FISH (1948)..........*Assistant Professor of Chemistry*
B.S., Iowa State, 1936; Ph.D., 1942.

ARTHUR FREEMAN GOULD (1947, 1948)..........*Assistant Professor of Mechanical Engineering*
S.B., Massachusetts Institute of Technology, 1936.

THOMAS HUTCHESON GRAINGER (1946, 1947)..........*Assistant Professor of Bacteriology*
B.A., Lehigh, 1936; M.S., 1938; Ph.D., 1946.

NATHAN B. GROSS (1946, 1947)..........*Assistant Professor of Psychology*
B.S., Chicago, 1938; M.S., Rochester, 1943; Ph.D., 1946.

THEODORE HAILPERIN (1946)..........*Assistant Professor of Mathematics*
B.S., Michigan, 1939; Ph.D., Cornell, 1943.

PETER HAVAS (1946)..........*Assistant Professor of Physics*
Dipl., Technische Hochschule, Vienna, 1938; Ph.D., Columbia, 1944.

LEROY DAY HOERNER (1947)..........*Assistant Professor of Military Science and Tactics*
Major, U.S.A.F.

‡RICHARD ANDREW HOUSEMAN................*Assistant Professor of Education*
B.S., Central Michigan College of Education, 1936; M.A., Columbia, 1942; Ed.D., 1946.

GEORGE ROBERT JENKINS (1948)..............*Assistant Professor of Geology*
B.A., Colorado, 1936; Ph.M., Wisconsin, 1938.

PAUL HARRY KAAR (1946)..................*Engineer of Tests, Fritz Laboratory*
B.S. in C.E., Illinois, 1938; M.S., Lehigh, 1948.

JOHN J. KARAKASH (1946)....*Assistant Professor of Electrical Engineering*
B.S. in E.E., Duke, 1937; M.S. in E.E., Pennsylvania, 1938.

JOHN DALE KELLY (1947)....................*Assistant Professor of Mechanical Engineering*
B.S. in Eng. Phys., Lehigh, 1929; M.A., Columbia, 1939.

ROBERT BAUMGARTNER KLEINSCHMIDT (1947)........*Assistant Professor of Mechanics*
B.S., Pennsylvania, 1931; M.S., 1932; M.A., 1941.

ALFRED PAUL KOCH (1946)....................*Assistant Professor of Accounting*
B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg), 1939; M.S., Bucknell, 1940.

ROGER EDWARD KOLM (1947)........*Assistant Professor of Civil Engineering*
B.S., Washington, 1940; M.S., Lehigh, 1942.

GEORGE WALLACE KYTE (1946, 1947)......*Assistant Professor of History*
A.B., California, 1940; M.A., 1941; Ph.D., 1943.

MARION CANDLER LAZENBY (1946)..........*Assistant Professor of German*
B.A., Birmingham-Southern, 1930; M.A., Vanderbilt, 1933; Ph.D., Johns Hopkins, 1941.

WILLIAM BADER LECKONBY (1946)............*Assistant Professor of Physical Education, Coach of Football*
B.S., St. Lawrence, 1939.

JOSEPH FRANCIS LIBSCH (1946)..........*Assistant Professor of Metallurgical Engineering*
B.S., M.S., Massachusetts Institute of Technology, 1940; D.Sc., 1941.

ALVIN CONRAD LOEWER, JR. (1948)................*Assistant Professor of Civil Engineering*
B.E., Johns Hopkins, 1942; Eng.D., 1948.

JAMES DECKER MACK (1947)..*Acting Librarian*
B.A., Lehigh, 1938.

*JAMES D. MCLANACHAN (1945)....*Assistant Professor of Military Science and Tactics*
B.S., Pennsylvania State, 1941; Capt., Cav., U. S. A.

MURRAY BURNS MCPHERSON (1947)..............*Assistant Professor of Civil Engineering*
B.S., Bucknell, 1942; M.S., State University of Iowa, 1947.

PAUL MEIER (1948)....*Assistant Professor of Mathematics and Astronomy*
B.A., Oberlin, 1941; M.A., Princeton, 1947.

†HIRAM MADISON MERRITT (1946)..............*Assistant Professor of Military Science and Tactics*
B.S., Oklahoma Agricultural and Mechanical, 1938; Maj., Inf., U. S. A.

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‡Resigned August 11, 1948.
*Resigned September 7, 1948.
†Resigned August 20, 1948.

HENRY DIETRICH MEYER (1947)..........*Assistant Professor of Psychology*
A.B., California (Los Angeles), 1939; Ph.D., 1946.

PERCIVAL FORD MILLER (1947)..............*Assistant Professor of Mechanics*
E.E., Rensselaer Polytechnic Institute, 1928; M.S., New York State College for Teachers (Albany), 1940; M.S., Cornell, 1948.

MITCHELL JOSEPH BERNARD MULHOLLAND (1946)....*Assistant Professor of Military Science and Tactics*
B.A., Fordham, 1939; Lt. Col., Air Corps, U. S. A.

JOHN ONILA (1948)....*Assistant Professor of Military Science and Tactics*
Capt., U. S. A.

GEORGE TERHUNE PECK (1946)..................*Assistant Professor of History*
B.A., Yale, 1937; M.A., Chicago, 1940; Ph.D., 1942.

ALBERT GORDON PETERKIN III (1948)....*Assistant Professor of Education*
B.A., Pennsylvania, 1936; M.A., Harvard, 1938.

GEORGE WHITEFIELD PETRIE III (1947)..................*Assistant Professor of Mathematics*
B.S., Carnegie Institute of Technology, 1933; M.S., 1936.

ALBERT AUGUSTUS RIGHTS (1933, 1943)......*Assistant Professor of English*
A.B., Maine, 1927; A.M., Harvard, 1931.

WILLIAM HEATON SCHEMPF (1947)...........*Assistant Professor of Music*
Mus.B., Wisconsin, 1939; Mus.M., Rochester, 1942.

HANS KARL SCHUCHARD (1946)................*Assistant Professor of German*
B.S., Pennsylvania, 1931; A.M., 1932; Ph.D., 1938.

WILLIAM SHERIDAN (1911, 1946).............*Assistant Professor of Physical Education; Coach of Wrestling, Soccer, and Lacrosse*

ARTHUR MASON SHERMAN, JR. (1948)........*Assistant Professor of Religion*
B.A., Trinity, 1938; B.D., Virginia Theological Seminary, 1942.

PAUL EDWARD SHORT (1938, 1946)..........*Assistant Professor of Physical Education; Assistant Director and Business Manager of Athletics*
B.S. in Bus. Adm., Lehigh, 1934.

MAX DONALD SNIDER (1946)................*Assistant Professor of Economics*
B.S., Illinois, 1936; M.S., 1937; M.B.A., Stanford, 1941.

JAMES W. SOVERNS (1948)...........*Assistant Professor of Military Science and Tactics*
Capt., U. S. A.

WILBUR DEVILLA BERNHART SPATZ (1946)............*Assistant Professor of Physics*
B.S., Lafayette, 1930; M.S., Purdue, 1934; Ph.D., New York University, 1943.

RONALD JAMES SWEENEY (1947)............*Assistant Professor of Mechanical Engineering*
M.E., Cornell, 1928.

EVERETT ANDERSON TEAL (1945)..........*Assistant Professor of Education, Director of the University Counseling Center*
B.S., Ball State Teachers College, 1932; M.A., Columbia, 1941.

JOHN SCHRADER TREMPER (1939)....................................*Assistant Registrar*
A.B., Colgate, 1928; M.A., Cornell, 1932; Ph.D., 1938.

Ralph Newcomb VanArnam (1928, 1942) ....*Assistant Professor of Mathematics and Astronomy*
E.E., Cornell, 1926; M.S., 1927.

John Hills Weitz (1947) .... *Assistant Professor of Geology*
A.B., Wesleyan, 1938; M.S., Lehigh, 1940.

Ralph Strafford Wentworth (1946) ....*Assistant Professor of Mathematics*
B.S., U. S. Naval Academy, 1912.

Donald Bingham Wheeler, Jr. (1947)....*Assistant Professor of Physics*
B.S. in Eng. Phys., Lehigh, 1938; Ph.D., California Institute of Technology, 1947.

Albert Wilansky (1948)..................*Assistant Professor of Mathematics*
B.A., Dalhousie, 1941; B.S., 1942; Ph.D., Brown, 1947.

Coy Wilton Wynn (1947)...................... *Assistant Professor of English*
B.A., Louisiana College, 1941; M.A., Louisiana State University, 1942.

Daniel Hunt Yarbro (1946)...............*Assistant Professor of Physical Education; Coach of Basketball, Track, and Cross Country*
B.S., North Texas State Teachers College, 1939; M.S., 1946.

Howard J. B. Ziegler (1947, 1948)......*Assistant Professor of Philosophy*
B.A., Franklin and Marshall, 1930; B.D., Theological Seminary of the Reformed Church in U. S., 1933; S.T.M., Lutheran Theological Seminary at Philadelphia, 1941.

LECTURERS

Frederick Paul Fay (1948).................*Lecturer in Industrial Engineering*
B.S. in E.E., Massachusetts Institute of Technology, 1932.

Harry Frederick Hoffman (1926)...............*Lecturer in Psychiatry and Mental Hygiene*
M.D., Hahnemann Medical College, 1910.

John McFall Sylvester (1946)...........*Lecturer on Plant Management*
Graduate, U. S. Naval Academy, 1911.

INSTRUCTORS

Fred Gartin Armstrong (1947)......................... *Instructor in Education; Counselor, University Counseling Center*
B.S., Ball State Teachers College, 1941; M.A., 1946.

Robert Edward Ashley (1948)...............*Instructor in Civil Engineering*
B.S. in C.E., Lehigh, 1942.

James Mercer Beauchamp, Jr. (1948).......*Instructor in Mechanical and Industrial Engineering*
B.S. in I.E., Lehigh, 1941; M.S., 1948.

Lynn Simpson Beedle (1947).......*Research Engineer, Fritz Laboratory*
B.S. in C.E., California (Berkeley), 1941.

Patterson Dix Benner (1946, 1947).......................*Instructor in English*
B.A., Miami (Ohio), 1942; M.A., Lehigh, 1948.

Leon Benson (1946).......................................*Instructor in Mathematics*
A.B., New York University, 1938.

HARVEY ELLIOT BRAZER (1948) .... *Instructor in Finance*
B.Com., McGill, 1943; A.M., Columbia, 1947.

JAMES THOMAS BROWN (1948) .... *Instructor in Civil Engineering*
B.S. in Ed., Northwestern, 1946.

ANTHONY JOSEPH BRYSKI (1947) .... *Instructor in Economics and Sociology*
B.S., Temple, 1940; M.A., New York University, 1947

CLARENCE BOWEN CAMPBELL (1947) ...... *Assistant Director of Admissions*
B.A., Temple, 1937; M.A., Lehigh, 1947.

‡PAUL FRANKLIN CAUFFMAN (1947) .... *Instructor in Mathematics*
B.S. in Ed., Pennsylvania State Teachers College (Shippensburg), 1932; M.A., Lehigh, 1938.

WILLIAM CHRISTIAN .... *Instructor in Physical Education, Assistant Coach of Football and Baseball*
B.S. in Ed., New Jersey State Teachers College (Trenton), 1939.

MANLEY WOODWARD CLARK (1947) .... *Instructor in Military Science and Tactics*
B.S. in Bus. Adm., Syracuse, 1936; 1st Lt., U.S.A. Res.

REUBEN HARVEY CLOSE (1948) .... *Instructor in Electrical Engineering*
B.S. in Ed., Pennsylvania State Teachers College (Mansfield), 1936; E.E., Cornell, 1940.

ROBERT ELWOOD CRISPEN (1946) .... *Instructor in Civil Engineering*
B.S. in C.E., Lehigh, 1937.

CLOYD CRISWELL (1947) .... *Instructor in English*
B.S. in Ed., Pennsylvania State Teachers College (Millersville), 1933; M.A., New York University, 1937.

ELIZABETH HAMMET DAVIS (1947) .... *Instructor in Journalism*
B.A., South Carolina, 1930; M.A., 1931.

JOAQUIN BERNABE DECASTRO (1948) .... *Instructor in Spanish*
B.A., Puerto Rico, 1936; A.M., Columbia, 1941.

ALBERT DENEUFVILLE (1948) .... *Instructor in Mechanics*
Dipl. Ing., Berlin, 1922; M.S., Stevens Institute of Technology, 1948.

VERNON HENRY WAGNER DESSENBERGER (1948) .... *Instructor in Education*
B.S., Temple, 1936; M.S., 1940.

ALTON PAIGE DIEFFENBACH (1948) ....*Instructor in Electrical Engineering*
B.S. in E.E., Lehigh, 1941.

DAVID DOCKHAM .... *Instructor in Physical Education, Coach of Lacrosse, Assistant Coach of Football and Baseball*
B.S. in Phys. Ed., Springfield, 1943.

DIEGO FLORES (1946) .... *Instructor in Spanish*
B.S., New York University, 1937; M.A., 1938.

*WALTON FORSTALL, JR. (1940) ... *Instructor in Mechanical Engineering*
B.S. in M.E., Lehigh, 1931; M.S., 1943.

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‡Resigned August 25, 1948.

*Absent of leave.

GORDON SAMUEL FYFE (1948)................................*Instructor in Economics*
A.B., Rochester, 1946; M.B.A., Pennsylvania, 1948.

ROBERT CHARLES GOOD, JR. (1946, 1947)..................*Instructor in Physics*
B.S. in Eng. Phys., Lehigh, 1940; M.S., 1947.

RALPH SCHULTZ GRABER (1946, 1948).........................*Instructor in English*
B.A., Lehigh, 1946; M.A., 1948.

JOHN HAMMES GROSS (1946, 1947).......................*Instructor in Metallurgy*
B.S. in Met.E., Lehigh, 1944; M.S., 1948.

HARRY THOMAS HAHN (1946)..........*Instructor in Education; Counsellor, University Counseling Center*
B.S., Pennsylvania State Teachers College (Kutztown), 1940; M.Ed., Temple, 1942.

ALBERT EDWARD HARTUNG (1947, 1948)..................*Instructor in English*
B.A., Lehigh, 1947.

WILLIAM GEORGE HAYWARD (1944)......................*Instructor in Education*
B.S., Rutgers, 1930; A.M., Columbia, 1932; Ed.D., 1940.

JOHN ATLEE HERTZ (1945)..*Instructor in English*
A.B., Moravian, 1938; M.A., Lehigh, 1947.

WILBUR HIBBARD (1946).......................................*Instructor in Mathematics*
B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg), 1932; M.A., Columbia, 1933.

CLARENCE LESTER HOGAN (1946, 1947).....................*Instructor in Physics*
B.S., Montana State, 1942; M.S., Lehigh, 1947.

JON JAMES HOPKINS (1948)......................................*Instructor in Speech*
B.E., Northern Illinois State Teachers College, 1941.

GEORGE HOWATT (1948)...*Instructor in History*
Ph.B., Muhlenberg, 1940; M.A., Lehigh, 1949.

LEMUEL ROY JOHNSTON (1945)..............................*Instructor in Education*
A.B., North Carolina, 1914; M.A., Columbia, 1925; Ph.D., New York University, 1926.

LOUIS CLAYTON JURGENSEN (1947)......................*Instructor in Accounting*
B.S.C., University of Iowa, 1942; M.A., 1947.

JOHN ATHAN KARAS (1946).......................................*Instructor in Physics*
B.S. in Eng. Phys., Lehigh, 1943; M.S., 1947.

‡FRANKLIN EDMUND KENYON (1946, 1947)............*Instructor in English*
B.Ed., New York State Teachers College (Cortland), 1945; M.A., Lehigh, 1948.

JAMES GILCHRIST KERR (1946, 1947)..................*Instructor in Metallurgy*
B.S., California Institute of Technology, 1944; M.S., Lehigh, 1947.

FREDERIC KNIGHT (1948)..*Instructor in Fine Arts*

ALFRED BAER LAPONSKY (1946, 1947)......................*Instructor in Physics*
B.S. in Eng. Phys., Lehigh, 1943; M.S., 1947.

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‡ Resigned January 22, 1949.

John Orth Liebig, Jr. (1946) .... *Instructor in Civil Engineering*
B.S. in C.E., Lehigh, 1940.

Edwin Sebastian Malesky (1949) .... *Adviser on Veterans Affairs and Selective Service*
B.S., Muhlenberg, 1935; M.Ed., Temple, 1941.

Joseph Abele Maurer (1947) .... *Instructor in Greek and Latin*
B.A., Moravian, 1932; M.A., Lehigh, 1936; Ph.D., Pennsylvania, 1948.

Joseph Bernard McFadden (1948) .... *Instructor in Journalism*
B.A., St. Joseph's (New Brunswick), 1941; M.A., Syracuse, 1948.

James William Mettler (1947) .... *Instructor in Mathematics*
A.B., Bucknell, 1933; A.M., 1942.

Carl Leland Moore (1948) .... *Instructor in Accounting*
A.B., Bucknell, 1943; M.A., Pittsburgh, 1948.

John Rees Moore (1947) .... *Instructor in English*
B.A., Reed, 1940; A.M., Harvard, 1942.

Edgar Kirton Muhlhausen (1946) ...... *Instructor in Civil Engineering*
B.S. in C.E., Lehigh, 1942; M.S., 1948.

Robert Dennis Mustain (1947) .... *Instructor in Accounting*
B.S., Chicago, 1943; M.B.A., 1947.

Benjamin Matthias Nead (1947, 1949) .... *Instructor in English*
B.A., Lehigh, 1947.

Russell Elwood Neal (1946, 1947) .... *Instructor in Civil Engineering*
B.S. in C.E., Lehigh, 1946.

Ellis Alvin Newton (1947) .... *Instructor in English*
A.B., Western Maryland, 1940; M.A., Lehigh, 1948.

Theodore Lyman Niles (1948) .... *Instructor in French*
B.A., Yale, 1941; M.A., Columbia, 1948.

Anthony Packer (1946) .... *Instructor in Physical Education, Coach of Freshman Football, Assistant Coach of Basketball and Baseball*
B.S., St. Lawrence, 1938.

Frank Vincent Palevicz (1946) .... *Instructor in Education, Assistant to the Director of Placement*
B.S. in Ed., New Jersey State Teachers College, 1938; M.Ed., Rutgers, 1946.

Vincent Aloysius Perry (1949) .... *Instructor in Finance*
A.B., New York University, 1948.

Roger Rawson (1946, 1948) .... *Instructor in Mechanical Engineering*
B.S. in M.E., Clemson, 1946; M.S., Lehigh, 1948.

Richard Noble Rhoda (1940, 1946) .... *Instructor in Chemistry*
B.S. in Chem., Pittsburgh, 1939; M.S., Lehigh, 1940; Ph.D., 1944.

Hope Thomas Martin Ritter, Jr. (1946, 1948) ...... *Instructor in Biology*
A.B., Cornell, 1943; M.S., Lehigh, 1947.

Frederic H. Ritze (1947) .... *Instructor in English*
A.B., Iowa Teachers College, 1942; A.M., Columbia, 1947.

Hugh Owen Roberts (1947) .... *Instructor in Accounting*
A.B., Michigan, 1946; M.B.A., 1947.

Donald George Sanders (1947) .... *Instructor in Mechanics*
B.S. in M.E., Lehigh, 1943.

John Whiting Schreiner, Jr. (1947) .... *Instructor in Military Science and Tactics*
1st Lt., U.S.A.

Richard Bell Seals (1948) .... *Assistant Director of Admissions*
B.A., Lehigh, 1947; M.A., 1949.

Henry Albert Seebald (1946) .... *Instructor in Mathematics*
B.A., Lehigh, 1942.

George Clinton Shay (1946) .... *Instructor in Mechanical Engineering*
M.E., Stevens Institute of Technology, 1944; M.S., Lehigh, 1948.

William Henry Williams Skerrett, Jr. (1947) .... *Instructor in Economics*
B.S., Haverford, 1942; M.A., Pennsylvania, 1947.

Richard Thomas Smith (1947) .... *Instructor in Electrical Engineering*
B.S. in E.E., Lehigh, 1946; M.S., 1947.

Richard Walton Smith (1948) .... *Instructor in Economics*
B.B.A., M.B.A., Michigan, 1948.

Robert Harry Spohn (1946, 1947) .... *Instructor in Mathematics*
A.B., Lebanon Valley, 1936; M.A., Lehigh, 1948.

Robert Evans Stevenson (1947) .... *Instructor in Geology*
B.S. in Chem., Hawaii, 1939; M.S., Washington State, 1942.

‡Richard Morgan Story, Jr. (1947) .... *Instructor in Mechanical Engineering*
B.S. in M.E., Vermont, 1940.

Kenneth Gilbert Swayne (1946, 1947) .... *Instructor in Mechanics*
B.S. in M.E., Lehigh, 1943; M.S., 1948.

John Harold Tarbell (1948) .... *Instructor in Finance*
A.B., Syracuse, 1923; M.A., 1924; Ph.D., 1934.

Vincent William Uhl (1947) .... *Instructor in Chemical Engineering*
B.S. in Ch.E., Drexel Institute of Technology, 1940.

Frank Joseph Velesz (1948) .... *Instructor in Economics*
B.A., Western Michigan, 1948.

Glenn Weaver (1946, 1947) .... *Instructor in History*
A.B., Catawba, 1941; B.D., Theological Seminary of the Reformed Church, 1944; M.A., Lehigh, 1947.

William Hall Wetmore (1947) .... *Instructor in Mechanical Engineering*
B.S. in M.E., Duke, 1943; M.S., Lehigh, 1948.

Thomas Allison White (1946) .... *Instructor in Physical Education, Assistant Coach of Football*
B.S. in Ed., Texas Christian, 1939.

William Beckler White (1946, 1948) .... *Instructor in English*
A.B., Hampden-Sydney, 1940; M.A., Lehigh, 1942.

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‡Resigned August 25, 1948.

Robert Charles Whitehead, Jr. (1946)........*Instructor in Mechanical Engineering*
B.S. in M.E., Bucknell, 1942; M.S., Lehigh, 1948.

Charles Roger Wilbur (1948)......*Instructor in Mechanical Engineering*
B.S. in M.E., Stevens Institute of Technology, 1946.

ASSISTANTS

Robert Michael Belmonte (1947)..........*Graduate Assistant in Physics*
B.S. in Eng. Phys., Lehigh, 1947.

Richard Edward Bergenback (1948)........*Graduate Assistant in Geology*
A.B., Lafayette, 1948.

John Bereznak, Jr. (1946)........*Assistant in Military Science and Tactics*
Master Sergeant, U. S. A.

Walter Boris (1947)................*Assistant in Military Science and Tactics*
First Sergeant, U. S. A.

Elwood Hunter Brubeck (1946)..........*Assistant in Military Science and Tactics*
Master Sergeant, U. S. A.

Marcel Cabijos (1946)..............................*Assistant in Physical Education, Coach of Fencing*

John Joseph Chessick (1948)...............*Graduate Assistant in Chemistry*
B.S., Pennsylvania State, 1948.

Joseph Raymond Cicchino (1947)..........*Graduate Assistant in Biology*
B.A., Montclair State Teachers College, 1942.

Willard Stanley Clewell, Jr. (1946)...............*Graduate Assistant in Chemistry*
B.S. in Chem., Lehigh, 1942; M.S., 1948.

Joseph Michael Clifford, Jr. (1948)........*Graduate Assistant in Physics*
A.B., Harvard, 1948.

Frederic Rudolph Crownfield, Jr. (1948)..........*Graduate Assistant in Physics*
A.B., Harvard, 1948.

William James Crowe (1947)..................*Graduate Assistant in Physics*
B.S. in Eng. Phys., Lehigh, 1947.

John Daniel (1946)..................................*Graduate Assistant in History*
Dipl., Concordia Theological Seminary (Missouri), 1936; M.A., Lehigh, 1947.

Russell Norman DeVinney (1948)........*Graduate Assistant in English*
A.B., Muhlenberg, 1948.

George Anson Dinsmore (1948).................*Graduate Assistant in Civil Engineering*
B.E., Yale, 1948.

Raymond George Dittig, Jr. (1948)............*Graduate Assistant in Civil Engineering*
B.S. in C.E., Lehigh, 1948.

Randolph Peter Dominic (1948)........*Graduate Assistant in Mechanical Engineering*
B.Aero.E., Rensselaer Polytechnic Institute, 1945.

Frederick Alexander Fatzinger (1948).............*Graduate Assistant in Psychology*
B.A., Lehigh, 1948.

Roger Smith Funk (1948) .... *Graduate Assistant in Mechanical Engineering*
B.S. in M.E., Lehigh, 1947.

Irving Galperin (1948) .... *Graduate Assistant in Chemistry*
B.A., Alfred, 1948.

George Lewis Gansz (1948) .... *Assistant in Music*
B.S., Temple, 1948.

Nathaniel Ellmaker Hager, Jr. (1947) .... *Graduate Assistant in Physics*
B.S., Franklin and Marshall, 1943; M.S., Lehigh, 1947.

Frank Hammet (1947) .... *Graduate Assistant in English*
A.B., Southwestern, 1941.

Jacob Thorsten Jacobsen (1948) .... *Graduate Assistant in Civil Engineering*
B.S. in C.E., Lehigh, 1948.

Ronald Henry Jeffrey (1947) .... *Graduate Assistant in Chemistry*
B.S. in Ch.E., Lehigh, 1947.

Ralph Richard Johnson .... *Assistant in Physical Education; Assistant Coach of Freshman Football, Basketball, and Baseball*
B.A., Lehigh, 1947.

Armwell J. Joines (1946) .... *Assistant in Military Science and Tactics*
Master Sergeant, U.S.A.

William Pursell Junkin (1948) .... *Graduate Assistant in Mechanical Engineering*
B.S. in A.E., Purdue, 1948.

Benjamin Collins Kenny (1947) .... *Graduate Assistant in Mathematics*
B.S., Bethany, 1947.

William Eugene King, Jr. (1948) .... *Graduate Assistant in Physics*
B.S., The Citadel, 1947.

George Samuel Kutscher (1947) .... *Graduate Assistant in Chemistry*
B.S., Albright, 1947.

Ward Townsend Langstroth (1948) .... *Graduate Assistant in Physics*
B.S. in Eng. Phys., Lehigh, 1947.

Norman Eugene Lasater (1947) .... *Assistant in Military Science and Tactics*
Master Sergeant, U.S.A.

Hart K. Lichtenwalner (1948) .... *Graduate Assistant in Chemistry and Chemical Engineering*
B.S. in Ch.E., Lafayette, 1943.

Bengt Sture Liljeroot (1948) .... *Graduate Assistant in Biology*
B.A., Upsala (New Jersey), 1948.

John Archibald MacFadyen, Jr. (1948) .... *Graduate Assistant in Geology*
A.B., Williams, 1948.

John Edward Mack (1948) .... *Graduate Assistant in Physics*
B.S., Montana State, 1948.

Carl Mann .... *Assistant in Physical Education, Head Trainer*
B.S. in Phys. Ed., Purdue, 1934.

LOUIS MAUS, JR. (1948) .... *Graduate Assistant in Chemistry and Chemical Engineering*
B.S. in Ch.E., Lehigh, 1947; M.S., 1948.

FRANK LEWIS MCCRACKIN (1947) .... *Graduate Assistant in Physics*
B.S., Montana State, 1947.

JOHN HOLTON MCGINN (1948) .... *Graduate Assistant in Physics*
B.A., Pennsylvania, 1943; M.S., 1948.

JAMES ALAN MCLENNAN, JR. (1948) .... *Graduate Assistant in Physics*
S.B., Harvard, 1948.

HERBERT L. MCVICAR (1948) ...... *Assistant in Military Science and Tactics*
Technical Sergeant, U.S.A.

STEPHEN JOSEPH METRO (1947) .... *Graduate Assistant in Chemistry*
B.S. in Chem., Lebanon Valley, 1945.

RICHARD JOSEPH MIKOVSKY (1947) .... *Graduate Assistant in Chemistry*
B.S. in Chem., Lehigh, 1947.

PAUL EDWARD GEORGE MILLER (1947) .... *Graduate Assistant in Chemistry*
B.S., Moravian, 1947.

JOHN ROSS MILLS (1947) .... *Graduate Assistant in Geology*
B.S., Franklin and Marshall, 1947.

STANLEY SOLTAN MOFFAT (1947) .... *Graduate Assistant in Chemistry*
B.A., Princeton, 1947.

JOHN HARVEY MOODY (1947) .... *Assistant in Military Science and Tactics*
Master Sergeant, U.S.A.

RAFFAELE FRANCESCO MURACA (1948) .... *Assistant in Chemistry and Chemical Engineering*
B.S. in Chem., Lehigh, 1944; M.S., 1947.

JOHN FRANCIS MURPHY (1947) .... *Assistant in Military Science and Tactics*
Staff Sergeant, U.S.A.

MARVIN SHERRILL RICHARDS (1948) .... *Graduate Assistant in Chemistry and Chemical Engineering*
B.S.E., Princeton, 1943.

DONALD ELLSWORTH RIVARD (1948) .... *Graduate Assistant in Chemistry*
B.S. in Chem., Tufts, 1942.

†EARL PETER RODGERS (1946) .... *Lecture Assistant in Physics, Meteorological Observer in the Department of Geology*

JOHN FRANCIS RUDZINSKI .... *Graduate Asistant in Chemistry*
B.S., Albright, 1947.

RICHARD WELLS RUSK (1946) .... *Graduate Assistant in Physics*
B.S. in Chem., Lehigh, 1938.

STANLEY RUTKOSKI (1947) .... *Assistant in Military Science and Tactics*
First Sergeant, U.S.A.

ROBERT HOLCOMB SHAW (1948) .... *Graduate Assistant in Mechanical Engineering*
B.S. in M.E., Worcester Polytechnic Institute, 1948.

JAMES DOWNS SHREVE, JR. (1947) .... *Graduate Assistant in Physics*
B.S., Franklin and Marshall, 1947.

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†Died December 29, 1948.

Delwyn C. Stone (1946) .... *Assistant in Military Science and Tactics*
Technical Sergeant, U.S.A.

Lewis H. Strauss (1947) .... *Graduate Assistant in Physics*
A.B., Harvard, 1947.

William Moss Strouse (1947) .... *Graduate Assistant in Physics*
B.S. in Eng. Phys., Lehigh, 1943.

Russell Norman Taylor (1948) .... *Graduate Assistant in Geology*
A.B., Colgate, 1948.

Willis Grant Thomas, Jr. (1947) .... *Graduate Assistant in Chemistry*
B.A., Lehigh, 1947.

Bruno Thürliman (1948) .... *Graduate Assistant in Civil Engineering*
Dipl., Swiss Federal Institute of Technology, 1946.

Michael Tikson (1948) .... *Graduate Assistant in Mathematics*
B.S., Youngstown, 1948.

Edwin Wilson Tooker (1947) .... *Graduate Assistant in Geology*
B.S., Bates, 1947.

Anastasios Anthony Topractsoglou (1947) .... *Graduate Assistant in Civil Engineering*
B.S. in C.E., Robert College, 1942; M.S., Minnesota, 1947.

Robert René Townsend (1948) .... *Graduate Assistant in Mathematics*
B.S., Muhlenberg, 1943.

George Clifton Travers, Jr. (1948) ... *Graduate Assistant in Chemistry and Chemical Engineering*
B.S. in Ch.E., Northeastern, 1948.

Lavern Wehby (1948) ...... *Graduate Assistant in Mechanical Engineering*
B.S. in M.E., Colorado, 1948.

Robert Lincoln Weida (1948) .... *Graduate Asisstant in Physics*
B.S. in Eng. Phys., Lehigh, 1948.

William Bedford Williamson (1948) .... *Graduate Assistant in International Relations*
B.S. in Ed., Temple, 1940; S.T.B., 1942; S.T.M., Lutheran Theological Seminary at Philadelphia, 1945.

Renn Zaphiropoulos (1947) .... *Graduate Assistant in Physics*
B.S. in Eng. Phys., Lehigh, 1947.

FELLOWS AND SCHOLARS

Harold Leo Becker .... *Lawrence Calvin Brink Research Fellow in Civil Engineering*
B.S., Duke, 1946; B.S. in C.E., 1947.

Dorothy Constance Bolmer .... *University Scholar in History*
A.B., New Jersey College for Women, 1945; M.A., Lehigh, 1948.

Minchen Ming Chow .... *New Jersey Zinc Company Research Fellow in Geology*
B.S., National University of Chungking, 1943; M.A., Miami (Ohio), 1948.

Wen-Pin Chuang .... *Gotshall Scholar in Metallurgical Engineering*
B.S., Northwestern Engineering College (China), 1942.

Allen Richard Deschere.......................*Gotshall Scholar in Mechanical Engineering*
B.S. in M.E., Worcester Polytechnic Institute, 1938; M.S., Lehigh, 1940.

Samuel Witten Dobyns................*Gotshall Scholar in Civil Engineering*
B.S., Virginia Military Institute, 1941.

Frederick Richard Gardner..........................*Sinclair Printing Ink Fellow*
B.S., Queens (Ontario), 1947.

Helga Francis Havas......................*Katharine Comstock Thorne Research Fellow in Bacteriology*
Dipl., Realgymnasium, Vienna, 1934; M.A., Columbia, 1944.

Donald Walter Kershner.........................*Gotshall Scholar in Chemical Engineering*
B.Ch.E., Delaware, 1948.

Walter Othmar Münz...................*C. Kemble Baldwin Research Fellow in Mechanical Engineering*
Dipl., Swiss Federal Institute of Technology, 1945.

David Maxwell Parke..................*Westinghouse Fellow in Mechanical Engineering*
B.S. in M.E., Lehigh, 1948.

Bernt Roald .... *Gotshall Scholar in Metallurgical Engineering*
Dipl., Technical University of Norway, 1947.

Israel Lewis Schneider...................*Garrett Linderman Hoppes Research Fellow in Civil Engineering*
B.S. in C.E., Newark College of Engineering, 1948.

Danilo Coelho Smith.................*University Scholar in Civil Engineering*
C.E., Rio Grande do Sul, 1943.

Donald Warren.....................*DuPont Research Fellow in Metallurgical Engineering*
B.S. in Met.E., Kentucky, 1948.

David Rowley Williams ....*DuPont Research Fellow in Mechanical Engineering*
B.S. in M.E., Drexel Institute of Technology, 1940; M.S., Lehigh, 1946.

SUMMER SESSIONS

(In addition to members of the regular staff)

Willard Paul Allen......*Principal, Fox Meadow School, Scarsdale, N. Y.*
B.S., College of Wooster, 1926; M.A., Western Reserve, 1933.

Mary M. Bartlett...........*Chairman, Department of English, New Jersey State Teachers College at Newark*
A.B., Barat, 1920; A.M., Columbia, 1938.

Ruth F. Boland.................*Director, Bureau of Child Services, Cambridge (Mass.) Public Schools*
A.B., Boston University, 1931; A.M., Columbia, 1940; Ed.D., Harvard, 1946.

Genevieve Bowen.......................*Assistant Superintendent of Elementary Instruction and Curriculum, Bucks County, Pa.*
B.A., Minnesota, 1932; M.A., 1933; Ed.D., Columbia, 1943.

ROBERT NEWTON DAVENPORT................*Supervisor of Special Education, Carbon, Lehigh, and Northampton Counties, Pa.*
A.B., Lafayette, 1931; M.A., New York University, 1939.

DANIEL R. DAVIES....................*Assistant Professor of Education, Teachers College, Columbia University*
A.B., Harvard, 1933; M.A., Bucknell, 1943; Ed.D., Columbia, 1946.

OSCAR GRANGER......................*Principal, Haverford Township Senior High School, Havertown, Pa.*
Ph.B., Chicago, 1919; M.A., 1924.

FRED W. HOSLER......................*Superintendent of Schools, Allentown, Pa.*
B.S., Pennsylvania State, 1920; A.M., Columbia, 1930; Ed.D., 1938.

THOMAS WILLIAM WATKINS.............*Supervising Principal, Coopersburg, (Pa.) High School*
A.B., Dickinson, 1931; M.A., Lehigh, 1942.

INSTITUTE OF RESEARCH

(Members of the research staff not listed in preceding sections)

RESEARCH PROFESSORS

LAWRENCE HENRY GIPSON (1924, 1946) *Research Professor of History*
A.B., Idaho, 1903; B.A., Oxford, 1907; Ph.D., Yale, 1918; Litt.D., Temple, 1947.

EDWIN RAYMOND THEIS (1927, 1938).....................*Research Professor of Industrial Biochemistry*
Ch.E., Cincinnati, 1921; Ph.D., 1926.

RESEARCH ASSOCIATES

HOWARD STEVENS DECK, B.S., Ph.D.
FRANK OLIVER DUFOUR, B.S.
THOMAS GARDE HARRIS, B.S. in Ch.E., M.S., Ph.D.
KYLE PALMER LAUGHLIN, B.A.
CHARLES FREDERICK SMULLIN, B.S. in Ch.E. M.S.
MICHAEL ALFRED STREICHER, B.Ch.E., M.Ch.E., Ph.D.
ROBERT LAMB STUBBINGS, B.S. in Chem., M.S.
WILLIAM TUFTS, B.S.
HAROLD SMITH WALKER, B.S.
WILLIAM COMSTOCK WALKER, B.S. in Ch.E., M.S., Ph.D.

RESEARCH ASSISTANTS

LOIS DARNELL ABSALOM
BARBARA BAKER, B.A.
LESTER RAY BARTRON, B.S. in Ch.E.
FU-KUEI CHANG, B.S., M.S.
CHIEN-HUO CHEN, B.S., M.S.
GEORGE PETER CONDON, B.S.
MARY WAIDELICH DAEUFER, B.S.
JOHN WEERT DEGROOT, JR., B.S.
CLYDE GEORGE ECKHART, B.S.
JAMES FREDERIC FEEMAN, B.S., M.S.

John Bass Freeman, A.B.
Leonard Pincus Fox, B.S. in Ch.E.
Ernest Gamble, Jr., B.S. in Ch.E., M.S.
Howard Halpin, B.S.
John Francis Hannan, B.S. in Chem.
Isaac Moyer Hunsberger, B.S. in Chem., M.S., Ph.D.
Richard Caldwell Huyett, B.S. in M.E.
Donald Seiz Johnson, B.S. in M.E.
William Dexter Johnson, B.S., M.S.
Mark Martin Jones, B.S. in Chem.
Frederick George Keihn, B.S.
William Edwin Keiser, B.S. in Chem., M.S.
William Edward Kelly, B.S.
Anne Gonsior King, B.A.
George William Lower, A.B., M.S.
John Charles Lukman, B.S.
Willard William Luxion, B.S., M.S.
Richard Griffith Malsberger, B.A.
Robert William McDonnell, B.S.
Leon Joseph McGeady, B.S. in Met.E., M.S.
Donald Miller Nace, B.S. in Ch.E.
Mary Hertzog Perry, B.A., M.S.
Edwin Thomas Pieski, B.S. in Chem., M.S.
Herbert Timothy Rights, B.S.
Charles Edward Rothermel, Jr., B.S.
Robert William Schneider, B.S. in Ch.E.
Adrienne Frances Scotchbrook, B.S.
Edward Sherman, B.S. in Chem., M.S.
Richard Nelson Shoemaker, B.S., M.S.
Theodore Albert Shook, B.S. in Eng. Phys.
Herbert Silvestri, B.S.
Shaler Gordon Smith, Jr., B.S. in Ch.E.
Gerald Clair Snyder, B.S., M.S.
Ralph Gustav Steinhardt, Jr., B.S. in Chem., B.S. in Ch.E., M.S.
Alice Fensterwald Strouse, B.A.
William Lester Stump, B.S. in Ch.E., M.S.
Thomas Clayton Thorstensen, B.S., M.S.
William Randell Ward, M.E.
Robert Wallace Way, B.S.
Marvin Paul Weaver, B.S.
James William Woods, B.S. in Chem., M.S.
Ching-Huan Yang, B.S.
Ai-Ting Yu, B.S., M.S.

STANDING COMMITTEES OF THE FACULTY

(The term of each member expires in June of the year given in parentheses after his name. The President is ex officio a member of all committees)

ADMISSIONS: Dean Congdon, Registrar Curtis *(ex officiis)*, Professors Allen (1949), Riley (1950), Shook (1951), Diamond (1952), Cutler (1953), Bartunek (1954).

ADVANCED STANDING: Registrar Curtis, Dean Congdon *(ex officiis)*, Professors Becker (1949), Severs (1950), Smail (1951), Sawyer (1952).

DISCIPLINE: Dean Congdon *(ex officio)*, Professors Doan (1949), Schulz (1950), and two student members: Charles Nicholls, Walter Morton.

EDUCATIONAL POLICY: Deans Congdon and Palmer, Professors Allen (vice Dean Carothers, on leave), Neville *(ex officiis)*, Sutherland (1949), Doan (1950), Riley (1951), Ford (1952), Harmon (1953).

FACULTY EDUCATIONAL CLUB: Professors W. L. Jenkins (1949), Rights (1949), Godshall (1950), R. M. Davis (1950), Christensen (1951), Gault (1951).

HONORARY DERGEES: Professors Gipson (1949), H. P. Thomas (1950), S. J. Thomas (1951), Bradford (1952), Myers (1953), Eney (1954).

HOUSE COMMITTEE, DROWN MEMORIAL HALL: Chaplain Bean *(ex officio)*, and two student members: John Head, Robert Courtney.

INSPECTION TRIPS: Professors Gruber (1949), Stuart (1950), Gallagher (1951), Jackson (1952), Libsch (1953).

PETITIONS: Registrar Curtis *(ex officio)*, Professors Koch (1948), Bayley (1949), Raynor (1949), Gallagher (1950), Hotchkiss (1950), Gault (1951).

PUBLICATIONS, BOARD OF: Associate Dean Seidle, Professor Wynn, Mr. Moravec *(ex officiis)*, Professor S. B. Ewing, and three student members: John Segraves, Roy Ditterline, Robert Wharry.

ROSTER: Registrar Curtis *(ex officio)*, Professors Graham (1949), Tremper (1950), Strauch (1951), Billinger (1952).

STANDING OF STUDENTS: Deans Congdon and Palmer, Professors Allen (vice Dean Carothers, on leave), Bewley, Callen, Doan, Eney, Myers, Neville, Stuart, Registrar Curtis, Director of G.C.D. H. P. Thomas *(all members ex officiis)*.

STUDENT ACTIVITIES: Associate Dean Seidle *(ex officio)*, Professors Fornoff (1949), Trembley (1950), and three student members: William Hunt, George LaSasso, Donald Love.

STUDENT CLUB FINANCES: Associate Dean Seidle *(ex officio)*, Professors Wynn (1949), F. B. Jensen (1950), and three student members: William Brennan, Warren Musser, Richard Parsons.

SUMMER SESSION: Director H. P. Thomas *(ex officio)*, Professors S. J. Thomas (1949), Allen (1950), Howland (1951), VanArnam (1952), Holme (1953).

ADMINISTRATION

Office of the President

Martin Dewey Whitaker, A.B., M.A., Ph.D., LL.D., Sc.D., *President*
Earl Kenneth Smiley, A.B., M.A., L.H.D., *Vice-President*
Paul Justus Franz, B.S. in Bus. Adm., *Assistant to the President*
Helen Genevieve Ryan, *Secretary*

Office of the Treasurer

John Irvine Kirkpatrick, B.S. in Bus. Adm., *Treasurer*
John Walter Maxwell, Jr., B.S., *Bursar and Purchasing Agent*
Stanley Frederick Heffner, *Manager of the Supply Bureau*
Edward A. Hower, *Manager of Realty, Brodhead Estate*
Edna Virginia Dean, *Secretary to the Treasurer*
‡Raymond Guy Kilpatrick, B.S. in Acctg., *Accountant*
Donald Walter Schmoyer, B.S. in Bus. Adm., *Assistant Accountant*
Edith Amanda Seifert, *Cashier*

Office of the Dean of Students

Wray Hollowell Congdon, A.B., M.A., Ph.D., *Dean*
John Douglas Leith, A.B., A.M., *Associate Dean*
Charles Augustus Seidle, B.A., M.A., Ed.D., *Associate Dean*
Edwin Sebastian Malesky, B.S., M.Ed., *Adviser on Veterans Affairs and Selective Service*

Office of the Registrar

George Bartlett Curtis, A.B., A.M., *Registrar and University Editor*
John Schrader Tremper, A.B., M.A., Ph.D., *Assistant Registrar*
Harry Kreiger Miller, Jr., B.S. in Chem., *Assistant to the Registrar*
Leanor Ruth Gilbert, *Recorder*
Virginia Raidline, *Assistant Recorder and Chief Clerk*

Office of the Director of Admissions

Wray Hollowell Congdon, A.B., M.A., Ph.D., *Director*
Byron Cromwell Hayes, B.E., M.A., *Associate Director*
Clarence Bowen Campbell, A.B., M.A., *Assistant Director*
Richard Bell Seals, B.A., M.A., *Assistant Director*

Deans of Divisions

Philip Mason Palmer, A.B., D.h.c., Litt.D., *Dean of the College of Arts and Science*

*Neil Carothers, B.A., Dip. in Econ., Ph.D., *Dean of the College of Business Administration*

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‡Resigned January 15, 1949.
*Absent on leave 1948-1949.

Directors of Curricula

PHILIP MASON PALMER, A.B., Dr.h.c., Litt.D., *Arts and Science*
*CARL ELMER ALLEN, B.S., M.S., Ph.D., C.P.A., *Business Administration*
HARVEY ALEXANDER NEVILLE, A.B., M.A., Ph.D., *Chemistry and Chemical Engineering*
WILLIAM JOSEPH ENEY, B.E., M.S., *Civil Engineering*
LOYAL VIVIAN BEWLEY, B.S. in E.E., M.S., *Electrical Engineering*
FRANK EVANS MYERS, B.A., M.S., Ph.D., *Engineering Physics*
HAROLD PRESCOTT THOMAS, B.S., Ed.M., Ed.D., *General College Division*
MILTON CALEB STUART, B.S. in M.E., M.E., *Mechanical Engineering and Industrial Engineering*
GILBERT EVERETT DOAN, Ch.E., Ph.D., *Metallurgical Engineering*
ALFRED COPELAND CALLEN, E.M., M.S., *Mining Engineering*

Summer Sessions and Adult Education

HAROLD PRESCOTT THOMAS, B.S., Ed.M., Ed.D., *Director*

Faculty

GEORGE BARTLETT CURTIS, A.B., A.M., *Secretary*

Legal Counsel

ROBERT SAYRE TAYLOR, SR., B.S., *Legal Counsel*

The University Library

†HOWARD SEAVOY LEACH, A.B., M.A., *Librarian*
JAMES DECKER MACK, B.A., *Acting Librarian*
ANNE STROWD FLANNERY, A.B., A.B. in L.S., A.M., *Head Cataloguer*
ELIZABETH JANE BORDNER, B.S. in Ed., *Second Assistant Cataloguer*
LILLIE HESS KOEHLER, B.S. in Ed., B.S. in L.S., *Head of the Circulation Department*
ELIZABETH REGINA HARTMAN, B.A., B.S. in L.S., *Assistant Circulation Librarian*
RUTH ELMINA COSGROVE PACE, B.A., B.S. in L.S., *Second Assistant Circulation Librarian*
MARY CLARA GRAVEZ, B.S., *Reference Librarian*
ROBERT FRANCIS RILEY, *Assistant Order Librarian*

Packer Memorial Church

THE REV. GEORGE MARTIN BEAN, B.S., B.D., *Chaplain*
RAMONA JEANNE BAKER, *University Organist*

The Fritz Engineering Laboratory

WILLIAM JOSEPH ENEY, B.E., M.S., *Head of the Department of Civil Engineering*
BRUCE GILBERT JOHNSTON, B.S. in C.E., M.S., Ph.D., *Director of the Fritz Engineering Laboratory*
MURRAY BURNS MCPHERSON, B.S. in C.E., M.S., *Hydraulics Laboratory*

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*Vice Dean Carothers, on leave.
†Died November 17, 1948.

Students' Health Service

CARL OTTO KECK, M.D., *Director*
JACK ELI COLE, B.S., M.D., *Assistant Director*
CLAUDIA GILLETTE BEARDSLEE, B.A., *Laboratory and X-ray Technician*
HILDA MARIE AMENT, R.N., *Nurse*
VERNA LORAYNE BLOOM, R.N., *Nurse*

University Counseling Center

EVERETT ANDERSON TEAL, B.S., M.A., *Director*
FRED GARTIN ARMSTRONG, B.S., M.A., *Counselor*
HARRY THOMAS HAHN, B.S. in Ed., M.Ed., *Counselor*
ELIZABETH GIBSON JENSEN, B.A., *Psychometrician*

Department of Intercollegiate Athletics

PERCY LEE SADLER, *Director*
ELBERT FRANCIS CARAWAY, B.S. in Ed., *Assistant Director*
PAUL EDWARD SHORT, B.S. in Bus. Adm., *Assistant Director and Business Manager*

University Band

WILLIAM HEATON SCHEMPF, Mus.B., Mus.M., *Director*
GEORGE LEWIS GANSZ, B.S., *Assistant Director*

Department of Buildings and Grounds

ANDREW WILLARD LITZENBERGER, *Superintendent of Buildings and Grounds*
EDWARD JOSEPH FARRELL, *Assistant Superintendent of Buildings and Grounds*
JOHN DAVID HARTIGAN, *Superintendent of the Power Plant*
†STANLEY HARRISON PETERS, *General Foreman*

Placement Bureau

ELIAS ROBINS MORGAN, M.E., *Director*
FRANK VINCENT PALEVICZ, B.S. in Ed., M.Ed., *Assistant to the Director*

Department of Public Relations

ROBERT FORD HERRICK, B.A., *Director*
CHARLES JOHN MORAVEC, B.S., *University News Editor*
LUCILLE LEWIS BARRETT, A.B., *Assistant News Editor*

Alumni Association

LEONARD HUBERT SCHICK, B.A., *Executive Secretary and Editor of the Lehigh Alumni Bulletin*

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†Died December 21, 1948.

Special Standing Committees

ADVISORY COUNCIL ON GENERAL EDUCATION: Professors Diamond, Executive Chairman, F. C. Becker, Butts, Crum, Doan, Gipson, Hazlehurst, Howland, Neville, Palmer, Shook, Smith, Sutherland, Trembley, Whitcomb.

APPRAISAL OF INSTRUCTORS AND COURSES: Professor Doan, Chairman, Dean Congdon, Professors Allen, Ford, Teal.

ART EXHIBITIONS: Professors Palmer, Howland, VanArnam, Criswell.

ATHLETIC ELIGIBILITY: Professors Sadler (*ex officio*), Simmons (1949), Leith (1950), H. P. Thomas (1951), Holme (1952), Mr. Franz.

"BOSEY" REITER CUP COMMITTEE: Dean Congdon, Chaplain Bean, Mr. Franz.

CHAPEL: Chaplain Bean, Dean Congdon, Professors Aiken, Beaver.

EXECUTIVE COMMITTEE OF THE GRADUATE FACULTY: Professors More (*ex officio*), Beaver (1949), Butts (1950), B. G. Johnston (1951), Harmon (1952), Myers (1953).

FELLOWSHIPS AND GRADUATE SCHOLARSHIPS: Professor More, Vice-President Smiley, Treasurer Kirkpatrick.

FORMAL UNIVERSITY EXERCISES: Professor Sadler, Chairman and Marshal, Professors Luckett, S. J. Thomas, Dean Leith, Mr. Herrick.

INSTITUTE OF RESEARCH: President Whitaker, Professor Neville (*ex officiis*), Professors Bratt (1949), Eney (1949), Myers (1950), S. J. Thomas (1950), Ford (1951), Serfass (1951).

LIBRARY: Professors J. D. Mack (*ex officio*), Amstutz, (1950), F. B. Jensen (1951), Karakash (1952), Kyte (1953), Pitcher (1954).

MUSIC: Professors Schempf, Palmer, Bean, Registrar Curtis.

PROFESSIONAL ENGINEERING DEGREES: Professors Bewley, Callen, Doan, Eney

REGISTER: Registrar Curtis, Vice-President Smiley, Professors Smith, Cowin.

SCHOLARSHIPS AND LOANS: Dean Congdon, Vice-President Smiley, Treasurer Kirkpatrick.

STUDENT CONCERT-LECTURES SERIES, FACULTY ADVISORY COMMITTEE ON: Professors Shook, Schempf, Mr. Moravec.

TEACHER PLACEMENT: Professor H. P. Thomas, Dean Palmer, Mr. Morgan.

WILLIAMS SENIOR PRIZES: Professor Severs, Chairman, Professors Becker, Bradford, H. B. Davis, Ford, Harmon.

LEHIGH UNIVERSITY

Lehigh University is a non-denominational private institution offering undergraduate and graduate work in liberal arts, business administration, and engineering, and a limited number of courses in adult education. Candidacy for baccalaureate degrees is restricted to men; but women are admitted on the same terms as men to the Graduate School, to the Summer Session, and to those courses which are offered in the Adult Education Program.

The main part of the physical plant, particulars regarding which are given in the section describing the buildings and grounds, is located in that portion of the City of Bethlehem which lies south of the Lehigh River. A tract of land on the north side of the city, with a field house and gymnasium, supplements the athletic and recreational facilities of the University.

Lehigh was founded in 1865 as the result of a movement to provide opportunity for young men to obtain a complete education, technical, literary, and scientific, which had been initiated by the Honorable Asa Packer, of Mauch Chunk. The establishment of the University was made possible by Judge Packer's contribution of a large tract of land and the sum of $500,000.00, to which he added largely by gift during his lifetime and by his will. The founder appears to have had in mind originally a school primarily technical, catering to the youths of the Lehigh Valley. However, as the details of the project were worked out by Judge Packer and his advisers, among whom the Right Reverend William Bacon Stevens, Bishop of the Diocese of Pennsylvania, played the outstanding rôle, the scope of the educational services contemplated was broadened greatly. The new institution, which opened its doors to young men from the country at large, was given the character of a small university, combining in a unique fashion the traditional American college of liberal arts, the Continental university, and the Continental technical institute of university rank. Opportunity to pursue work of an advanced type and to carry on research was offered, in addition to training in the more elementary branches of both cultural and scientific studies.

Today, as at the time of its founding, Lehigh bases its program on the premise that an education, if it is to provide a sound basis for successful living in the full sense of the word, must combine with the acquisition of knowledge and skills fundamental in the professions, courses designed to broaden the vision and to enrich the personal life of the individual. Requirements for graduation therefore include, in addition to studies preparatory to a career, a generous number of courses whose primary aim is to acquaint the student with the nature and problems of the world in which he lives and to develop him as an individual.

The core of each major, required of all students electing it, is that sequence of studies which experience has proved to be indispensable in the field of endeavor for which preparation is being made; but individual interests and aptitudes are provided for by electives and, where it is possible, by optional majors within curricula. The organization of the institution as a small university contributes to the goal of meeting individual needs by enabling students enrolled in one college to pursue in other colleges those studies for which they are qualified and from which they can profit, and by making it possible for students who, after having enrolled in any given curriculum, discover that their choice was ill-founded to transfer to a curriculum more suited to their interests and abilities. An advisory system, in part compulsory and in part on a voluntary basis, insures that the student will seek and obtain, where it is essential, advice in planning for his future career and will have ample opportunity, where it is desirable to discuss with qualified and sympathetic advisers not only problems of a type related to his course of study but also those of a more personal nature.

Supplementing the formal academic program is an extensive program of extra-curricular activities, in all of which students have the assistance of competent faculty advisers.

Of importance also to the University's attainment of its purpose is its location in the heart of a metropolitan area, which, with its large number of manufacturing and commercial establishments, provides an opportunity for the student to become intimately acquainted with and adapt himself to the type of civilization that has become characteristic of our age.

ADMISSION REQUIREMENTS

The enrollment of Lehigh University is strictly limited by action of its board of trustees, with a resulting limitation in the number of candidates who can be admitted each year in the several divisions of the University. In the selective procedure necessitated by this limitation, the University, through its office of admissions, takes into account a number of criteria, which are believed to have some individual validity, and in combination a high degree of validity, in predicting probable success in college work. The object is to select those candidates who are most likely to profit fully by the programs offered at this University.

Qualified women may be admitted to pursue work on the graduate level or courses offered on the Adult Education Program. Undergraduate courses may be taken by women only during the summer.

HIGH SCHOOL CREDITS

All candidates must offer fifteen units of entrance credit, by certificate from an accredited school, or by examination, or by a combination of these methods. The fifteen units represent the quantitative equivalent of the usual four-year high school or preparatory school course and must include certain prescribed subjects, together with sufficient electives to make up the required total. The only subjects prescribed are those which are essential prerequisites for college courses which the student should take in his first year in the University.

For the several colleges within the University, the prescribed subjects and the number of electives are as follows:

For the College of Arts and Science—

	Units[*]
English	3
Foreign Language (ordinarily Latin or German or French or Spanish)	2
Elementary and Intermediate Algebra	1½
Plane Geometry	1
Electives	7½
	15

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[*] A unit represents a year's study in a single subject in a secondary school, comprising the work of 180 recitation periods (5 periods a week for 36 weeks) of 40 minutes each or the equivalent.

For the College of Business Administration—

	Units*
English	3
Elementary and Intermediate Algebra	1½
Plane Geometry	1
Electives	9½
	15

For the College of Engineering—

	Units*
English	3
Elementary and Intermediate Algebra	1½
Plane Geometry	1
Plane Trigonometry and Logarithms	½
†Solid Geometry or Advanced Algebra	½
Electives	8½
	15

The electives may be offered in any subject studied under standard conditions in an accredited high school or preparatory school. In general, electives in the fields of foreign language, mathematics, history, and science are preferred; but in the case of a superior student the requirements as to electives may be satisfied in whole or in part by courses in commercial subjects, manual arts, or fine arts.

It should be understood, however, that meeting in full the foregoing subject requirements does not insure admission, but insures only eligibility for consideration in the light of remaining criteria.

QUALITY OF WORK

The quality of the student's work will be judged primarily by his rank or relative average grade in his class. Consideration will be given also to the extent to which he has made grades distinctly higher than the passing grade; to evidence of improvement or deterioration in quality in the course of his progress through the secondary school; to his relative success or failure in the particular subjects which he proposes to continue in college; and to the comments and recommendations of his principal or headmaster.

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*A unit represents a year's study in a single subject in a secondary school, comprising the work of 180 recitation periods (5 periods a week for 36 weeks) of 40 minutes each or the equivalent.

†Students should present solid geometry if possible; those who do so register for Math. 11, Algebra and Analytic Geometry, in their first semester. Students who present advanced algebra for entrance register for Math. 11a, Solid Geometry and Analytic Geometry in their first semester. Training in both solid geometry and advanced algebra is required for graduation.

OTHER CRITERIA AND INTERVIEWS

Information with respect to the other qualifications considered, including sound health, emotional stability, intellectual motivation, and established habits of industry and regularity, is obtained from principals and headmasters, and through personal interviews. The University reserves the right to require any candidate for admission to present himself for an interview and to base the selection of candidates in part upon the appraisals obtained through such interviews.

ENTRANCE EXAMINATIONS

All candidates for admission to the freshman class at Lehigh University will be required to write entrance examinations prepared by the College Entrance Examination Board. Ordinarily, candidates for admission to the fall semester who will be graduated from preparatory or high school the preceding June should write the examinations in April before graduation from preparatory or high school.

The examinations are required so that supplementary evidence may be obtained as to the applicant's readiness to do successful college work in the curriculum in which he wishes to enroll. The examination results are also used to assist in proper placement of the student during his freshman year.

Satisfactory performance in these examinations will not be regarded as sufficient evidence that an applicant is qualified to undertake college work when his secondary school record is unsatisfactory. On the other hand, a reasonable performance on the entrance examinations is required even of those applicants who have ranked high in preparatory or high school.

The following examination sequences are prescribed:

For the College of Arts and Science:

Scholastic Aptitude Test (Program I)
English Achievement Test
An additional achievement test to be specified by the admissions office.

For the College of Business Administration:

Scholastic Aptitude Test (Program I)
English Achievement Test
Social Studies Achievement Test

For the College of Engineering:

Scholastic Aptitude Test and Comprehensive Mathematics Test (Program III)
English Achievement Test
An additional achievement test to be specified by the admissions office.

The College Entrance Examination Board will administer its tests during 1949-1950 as follows:

Saturday, April 9, 1949
Saturday, June 4, 1949
Wednesday, August 24, 1949
Saturday, January 14, 1950
Saturday, April 15, 1950
Saturday, June 3, 1950
Wednesday, August 23, 1950

The following program of tests will be offered on each date:

8:45 A.M.—Program I: Scholastic Aptitude Test
Program II: Scholastic Aptitude Test and Intermediate Mathematics Test
Program III: Scholastic Aptitude Test and Comprehensive Mathematics Test

1:45 P.M.—Achievement Tests—Not more than three of the following one-hour tests:

English Composition
Social Studies
French Reading
German Reading
Spanish Reading
Latin Reading
Greek Reading (April only)
Italian Reading (April only)
Chemistry
Biology
Physics
Spatial Relations

Application forms for the examinations of the College Entrance Examination Board may be secured from the Office of Admissions of Lehigh University or from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey. Applications to write the April examination should reach the College Entrance Examination Board at least one month prior to the date of the examination.

ADMISSION PROCEDURE

APPLICATIONS FOR ADMISSION

Applications for admission to the University should be submitted to the Office of Admissions, Lehigh University, Bethlehem, Pennsylvania, at the end of the junior year or as early as possible during the applicant's senior year in secondary school. Normally, it will be impossible to consider applications which are received after March 1 of the year in which the applicant hopes to enter. Appropriate forms for filing applications for admission may be secured from the office of admissions.

ACCEPTANCE OF ADMISSION AND DEPOSIT

Each candidate who is notified of admission is required to file with the office of admissions, within ten days after such notification, a formal acceptance of his admission, asserting his definite intention to enter Lehigh University on a specified date; and this formal acceptance must be accompanied by a deposit of $50.00 (check or money order payable to Lehigh University).

This deposit will be applied toward the tuition charges for the first semester; but the deposit is forfeited in case of non-enrollment for the specified semester.

ADMISSION TO ADVANCED STANDING

Candidates for admission by transfer from other institutions may be admitted with advanced standing, subject to the enrollment limitations of the several divisions of the University, provided their college records up to the time of transfer are thoroughly satisfactory to the University. Such candidates must have met the entrance requirements prescribed for undergraduates of Lehigh University.

A student who desires to transfer to Lehigh University from another university, college, or junior college, must submit an official transcript of his record in the other institution; this transcript should include his college credits, a list of the entrance credits accepted for admission to the other institution, and a statement of honorable dismissal. A copy of the catalog of the college or university previously attended should be sent to the office of admissions.

A candidate who has attended more than one university, college, or junior college, must present a record from each institution; failure to submit a complete record of former academic experience will result in cancellation of registration.

Graduates of recognized colleges of liberal arts and sciences whose courses have included a year of physics, a year of chemistry, and mathematics through the calculus may ordinarily earn the degree of B.S. in engineering from Lehigh University on the successful completion of a two-year program which will be individually planned for each candidate.

A student who intends to enter an engineering curriculum at Lehigh University after graduation from college should so arrange his work in college as to cover as many as possible of the subjects of the freshman and sophomore years of the engineering curriculum he selects.

EXAMINATIONS FOR ADVANCED STANDING

Candidates who have completed advanced courses in approved secondary schools may establish advanced standing on the basis of these courses by taking anticipatory examinations. This privilege is granted only on petition, approved by the director of admissions and the department or departments concerned; and the examinations are to be taken at times fixed by the University.

Candidates for admission who wish to take examinations for advanced credit in any subject should notify the director of admissions at least one month prior to the date of registration.

VACCINATION REQUIREMENT

Smallpox vaccination is required, under the laws of the Commonwealth of Pennsylvania, of all students entering the University. Certificates are accepted for this requirement when the vaccination has been performed within three years of the time of matriculation, has resulted in a true vaccinia (take), and the scar gives evidence of a recent vaccinia. Since the vaccinations at the University are performed and the reactions read by the method recommended by the United States Public Health Service, students are advised to wait until they arrive at the University to have this done.

LATEST DATE FOR REGISTRATION

No registration of new students is accepted later than the tenth day of instruction in any semester.

UNDERGRADUATE FEES

The tuition fee for undergraduates carrying more than fifteen semester hours of work is $300.00 per semester in the College of Engineering and $275.00 per semester in the College of Arts and Science, the College of Business Administration, and the General College Division. A student regularly enrolled in any of the undergraduate divisions of the University who registers for fifteen hours or for fewer than fifteen hours of work will pay either $20.00 for each semester hour carried* or the regular tuition fee for the division in which he is enrolled, whichever amount is lower.

For the half-semester of eight weeks offered during the summer, the tuition fee is $150.00 for students in the College of Engineering and $137.50 for those in the colleges of Arts and Science and Business Administration and in the General College Division.

The tuition charge is comprehensive, there being no additional fees for athletics, health service, library, student activities, or student concert-lectures. In addition, there are no matriculation, graduation, or laboratory fees.

MILITARY DEPOSITS. A deposit of $25.00 is made by each student taking courses in military science and tactics. This deposit is refunded when the government property issued to the student is returned.

CHEMISTRY BREAKAGE. Students taking chemistry laboratory courses are required to reimburse the University for returnable equipment broken or otherwise damaged and for all chemicals used in excess of reasonable amounts. To cover possible charges of this nature, all students registering for laboratory courses in chemistry purchase coupon books, the unused portions of which are redeemed.

EXAMINATION FEES. Students who for satisfactory reasons absent themselves from final examinations will be allowed upon petition, to take make-up examinations without payment of any examination fee. A fee of $5.00 is charged for any examination subsequent to the first regular final or make-up examination allowed upon petition in any course. This regulation applies to the psychological and placement examinations required of new students if taken at some time other than that scheduled.

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*In computing tuition charges on the semester-hour basis, Engl. 0 is considered a three-hour course.

A fee of $5.00 is charged for anticipatory examinations taken by students to establish advanced standing on the basis of work completed in secondary schools.

LATE REGISTRATION FEE. A student presenting himself for registration after the last day of registration is subject to a penalty of $10.00, irrespective of the number of days of delay.

LATE PAYMENT FEE. A student who does not pay his University bill within three days after the date on his registration ticket is subject to a penalty of $5.00 on the fourth day and $1.00 for each succeeding day until his bill is paid.

LATE PHYSICAL EXAMINATION FEE. Any student who fails to keep his appointment for his physical examination is charged a late examination fee of $10.00. If he fails to meet the second appointment or any subsequent appointments, he again becomes subject to the penalty.

REFUNDS. In the event that a student withdraws from the University after the payment of tuition, he is entitled to receive a refund of his total tuition less $50.00 and less a deduction of two percent of the total tuition paid for each day of instruction completed, computed from the first day of instruction in the semester.

A graduate or adult education or summer session student who formally withdraws from the University is entitled to receive a refund of his total tuition less $5.00 for each credit hour for which he is registered and less a deduction for each day of instruction of two per cent of the total tuition paid, computed from the first day of instruction in the semester.

In the event of the death of a student or his induction into the armed forces, tuition will be refunded in proportion to the fraction of the semester remaining at the time of his death or induction.

No student who is suspended or expelled from the University shall be entitled to any refunds.

No refunds will be made to any student for any reduction in his schedule after the tenth day of instruction in a regular semester or the corresponding date in a summer session.

ESTIMATE OF EXPENSES

Expenses of undergraduates vary somewhat according to the habits and tastes of the individual students. There are certain basic expenses, however, which must be met by all students; and these are listed below. A schedule of necessary expenses for the two semesters of the freshman year might be constructed as follows:

	Colleges of Arts and Science and Business Administration		*College of Engineering*	
First Semester	**Minimum**	**Average**	**Minimum**	**Average**
Tuition	$275.00	$275.00	$300.00	$300.00
Books	25.00	30.00	30.00	35.00
Supplies	5.00	10.00	20.00*	25.00*
Board	160.00	200.00	160.00	200.00
Room	50.00**	75.00	50.00**	75.00
Military Deposit	25.00***	25.00***	25.00***	25.00***
	$540.00	$615.00	$585.00	$660.00
Second Semester	**Minimum**	**Average**	**Minimum**	**Average**
Tuition	$275.00	$275.00	$300.00	$300.00
Books & Supplies	10.00	15.00	15.00	20.00
Board	160.00	200.00	160.00	200.00
Room	50.00**	75.00	50.00**	75.00
	$495.00	$565.00	$525.00	$595.00
Total	$1035.00	$1180.00	$1110.00	$1255.00

*These figures do not include drawing instruments nor slide rule. The latter vary in price, but adequate drawing instruments may be purchased at about $18.00 and slide rules at about $16.00.

**There are a limited number of dormitory rooms at $35.00 per semester. Ordinarily these rooms are not available to freshmen.

***Returned at the end of the year.

Items of personal expense, clothes, travel, and the like cannot be estimated except for each student individually, according to his personal habits and circumstances. If a prospective student plans to accept an invitation to join a fraternity he should anticipate an additional annual cost of approximately $90.00 plus the amount of initiation fee.

Books, stationery, and drawing instruments may be purchased at the Supply Bureau in the Alumni Memorial Building.

LIVING QUARTERS AND BOARD

DORMITORIES

The University has five permanent dormitories located on the college campus, the total capacity of which has been increased for the period of expanded enrollment to 1030. The increase in the accommodations available has been accomplished by assigning to the larger rooms and suites more students than would be housed in them during normal times, a compensatory reduction in rental fees being made.

Beginning with the academic year 1949-50, all freshmen will be required to reside in the University dormitories on the campus, except those who live within commuting distance and prefer to live at home, and married students who establish their homes in the Bethlehem area.

Rentals in the permanent dormitories range from $50.00 to $125.00 per student per semester.

In addition to the permanent dormitories, there are three temporary quonset huts on the campus with accommodations for 120, in which rentals are $35.00 and $50.00 per semester per student. Applicants for these temporary quarters are advised to inspect them before signing leases, if at all possible.

Information regarding all dormitories can be obtained from the office of admissions.

APARTMENTS

To the extent of its ability, the University assists married students in obtaining furnished or unfurnished apartments. Twenty-eight two- and three-room unfurnished apartments in converted wooden barracks, located on East Laurel Street on the north side of the city, are maintained by the University for rental to students and staff members who are veterans.

Married students who are not veterans and veterans who can not be accommodated in the Laurel Street apartments are referred to the Bureau of Housing Information for such assistance as this agency can render. A personal visit to the Bureau, well in advance of the date on which the student expects to enroll at the University, is highly advisable.

DINING SERVICE

The University operates a cafeteria in Lamberton Hall. Regular meals are served daily from 7:00 A.M. to 9:30 A.M., 11:15 A.M. to 1:00 P.M., and 5:15 P.M. to 6:30 P.M. while the University is in session.

There are also a number of restaurants in the business district, just off the campus.

SUMMER HALF-SEMESTER

As a partial extension of the accelerated program under which the University operated from May, 1942 to June, 1947, there was provided during the summers of 1947 and 1948, in addition to the regular summer sessions, an eight-week half-semester. Students attending the summer half-semester carried half the number of courses and attended in each course twice the number of class exercises weekly that they would during a regular semester. The maximum number of hours allowed was nine, except that a student whose roster included a four-hour course was permitted to take a total of ten hours.

A similar arrangement is planned for the summer of 1949.

The College of Arts and Science

THE COLLEGE OF ARTS AND SCIENCE

Administrative Officers

Martin Dewey Whitaker, *President*

Earl Kenneth Smiley, *Vice-President*

Philip Mason Palmer, *Dean of the College of Arts and Science*

Wray Hollowell Congdon, *Dean of Students and Director of Admissions*

George Bartlett Curtis, *Registrar*

Faculty

William Appleton Aiken	*History*
Fred Gartin Armstrong	*Education*
Ray Livingstone Armstrong	*English*
Allen Jennings Barthold	*Romance Languages*
Frank Swan Beale	*Mathematics*
George Martin Bean	*Religion*
Lewis White Beck	*Philosophy*
Frank Chester Becker	*Philosophy*
Patterson Dix Benner	*Speech*
Leon Benson	*Mathematics*
Robert Allen Bream	*Education*
John Olson Chellevold	*Mathematics*
Glenn James Christensen	*English*
Wray Hollowell Congdon	*Education*
Raymond Gibson Cowherd	*History*
Vincent Frederick Cowling	*Mathematics*
Cloyd Mann Criswell	*English*
Earl LeVerne Crum	*Greek*
Edward Hutchins Cutler	*Mathematics*
Joaquin Bernabe DeCastro	*Spanish*
Vernon H. W. Dessenberger	*Education*
Aurie Nichols Dunlap	*International Relations*
Ephraim Bryson Everitt	*English*
S. Blaine Ewing	*English*
George Dormer Farné	*Romance Languages*

Diego Flores	*Romance Languages*
Adelbert Ford	*Psychology*
Hugh Richard Gault	*Geology*
Lawrence Henry Gipson	*History*
Wilson Leon Godshall	*International Relations*
Ralph Schultz Graber	*English*
James Larmour Graham	*Psychology*
Thomas Hutcheson Grainger, Jr.	*Biology*
Nathan B. Gross	*Psychology*
Harry Thomas Hahn	*Education*
Theodore Hailperin	*Mathematics*
George Dewey Harmon	*History*
Albert Edward Hartung	*English*
William George Hayward	*Education*
John Atlee Hertz	*English*
Wilbur Hibbard	*Mathematics*
Jon James Hopkins	*Speech*
George Howatt	*History and Government*
Garth Ahyman Howland	*Fine Arts*
George Robert Jenkins	*Geology*
William Leroy Jenkins	*Psychology*
Lemuel Roy Johnston	*Education*
Franklin Edmund Kenyon	*English*
Frederic Knight	*Fine Arts*
George Wallace Kyte	*History*
Kenneth Worcester Lamson	*Mathematics*
Voris V. Latshaw	*Mathematics*
Marion Candler Lazenby	*German*
Joseph Abele Maurer	*Latin and Greek*
Joseph Bernard McFadden	*Journalism*
Paul Meier	*Mathematics*
James William Mettler	*Mathematics*
Henry Dietrich Meyer	*Psychology*
John Rees Moore	*English*
Robert Pattison More	*German*
Ellis Alvin Newton	*English*
Theodore Lyman Niles	*French*
Bradford Breckenridge Owen	*Biology*
Frank Vincent Palevicz	*Education*
Philip Mason Palmer	*German*

Basil Waldo Parker	*Biology*
George Terhune Peck	*History*
Albert Gordon Peterkin III	*Education*
George Whitefield Petrie III	*Mathematics*
Arthur Everett Pitcher	*Mathematics*
Maurice John Quinlan	*English*
George Emil Raynor	*Mathematics*
Albert Augustus Rights	*English and Speech*
Edgar Heisler Riley	*English*
Hope Thomas Martin Ritter, Jr.	*Biology*
Frederic H. Ritze	*Speech*
William Heaton Schempf	*Music*
Hans Karl Schuchard	*German*
Ernst Bernard Schulz	*Government*
Henry Albert Seebald	*Mathematics*
Jonathan Burke Severs	*English*
Arthur Mason Sherman, Jr.	*Religion*
Clarence Albert Shook	*Mathematics*
Lloyd Leroy Smail	*Mathematics*
Robert Metcalf Smith	*English*
Rafael Arcangel Soto	*Romance Languages*
Robert Harry Spohn	*Mathematics*
Robert Evans Stevenson	*Geology*
Robert Roth Stoll	*Mathematics*
Carl Ferdinand Strauch	*English*
Everett Anderson Teal	*Education*
Harold Prescott Thomas	*Education*
Stanley Judson Thomas	*Biology*
Francis John Trembley	*Biology*
Ralph Newcomb VanArnam	*Mathematics and Astronomy*
Glenn Weaver	*History*
John Hills Weitz	*Geology*
Ralph Strafford Wentworth	*Mathematics*
Lawrence Whitcomb	*Geology*
William Beckler White	*English*
Albert Wilansky	*Mathematics*
Bradford Willard	*Geology*
Horace Wetherill Wright	*Latin*
Coy Wilton Wynn	*Journalism*
Howard J. B. Ziegler	*Philosophy*

THE COLLEGE OF ARTS AND SCIENCE

The College of Arts and Science of Lehigh University comprises the departments of biology, education, English, fine arts, geology, German, Greek, history and government, international relations, Latin, mathematics and astronomy, music, philosophy, psychology, religion, and romance languages. Courses in economics, sociology, accounting, and finance are provided by the College of Business Administration; physics and chemistry are supplied by the College of Engineering.

The degree of Bachelor of Arts is conferred upon graduates of the College of Arts and Science.

REQUIREMENTS FOR GRADUATION

1. The completion of one hundred twenty credit hours of collegiate work, apportioned so as to cover the distribution and concentration requirements, in addition to military science and tactics, and physical education, required of all students.

2. The passing of a comprehensive examination in the major field.

THE COURSE OF STUDY

Each student in the College of Arts and Science is considered from the beginning of his course as an individual. The College expects every student to have a well-defined purpose at entrance, but recognizes the student's right to change his objective, and for that reason gives him two years in which to find himself and establish the direction of his future career. To help the student in his decision, the College provides an advisory staff consisting of the dean of the College, who is adviser of freshmen, and the heads of departments in which major sequences are given. The individual program for each student is outlined tentatively in an interview with the dean of the College during freshman week. This preliminary program is determined by the nature and quality of the student's preparation and by the student's personal interests. The final program, which is made out in detail at the end of the sophomore year, takes into account, in addition, demonstrated aptitudes and pre-professional or vocational needs.

These individual programs admit of considerable elective choice. The number of elective courses depends upon the demands of the distribution and concentration requirements, which occupy from sixty to eighty per cent of the student's time. The number of purely elective hours ranges from twenty-one to forty-five out of the hundred and twenty required for graduation. In general, the student in the College of Arts and Science may elect any undergraduate course given at the University for which he has the prerequisites. This privilege, combined with the wide choice offered by the major sequences, *i. e.,* the concentration requirements, enables the College to provide specialization in a large number of fields and preparation for individual careers.

PREPARATION FOR PROFESSIONAL SCHOOLS AND THE PROFESSIONS

The College of Arts and Science provides the preliminary training necessary for admission to the various graduate schools and, in some cases, prepares directly for a profession. Since a large proportion of the graduates of the College of Arts and Science of Lehigh University continue their work in graduate schools, the College offers a number of course combinations designed to give preliminary training for the various fields of medicine, dentistry, public service, public health, law, theology, engineering, business administration, etc. Students who are looking forward toward any one of the graduate schools should consult the dean of the College, who will assist them in planning their courses.

THE FIVE YEAR COMBINED COURSE IN ARTS AND ENGINEERING

Students who are looking forward to a career in engineering and can afford the time and expense are advised to enroll in the five year combined course. Such students will meet the distribution requirements of the College of Arts and Science and take as a major sequence all of the work in science, mathematics, and engineering prescribed by the engineering curriculum of their choice, up to the end of the junior year in engineering. The comprehensive examination will be the Graduate Record Examination in Engineering. At the end of the fourth year of successful study the B.A. degree is conferred. For the fifth year the student transfers to the College of Engineering and enrolls normally for the senior year of his engineering curriculum. A detailed plan is made out for each student. The dean of the College of Arts and Science is the adviser of all five year men during their first four years.

THE CURRICULUM

The curriculum is based upon the principles of distribution and concentration. The object of the distribution requirements is to give the student an elementary knowledge of the fields of contemporary thought and to orient him in the world of man and nature.

Distribution Requirements

The distribution requirements are administered by the dean of the College of Arts and Science in accord with the group regulations given below. The subjects required of the individual student depend in part upon the field in which he expects to major, in part upon his personal preference, and in part upon the subjects he has taken in secondary school.

GROUP I

ENGLISH. The normal requirement in English is Engl. 1 and 2, Composition and Literature, six semester hours, in the freshman year, and six semester hours of English or American literature in the sophomore year, a total of twelve hours. Students who demonstrate satisfactory ability in written composition in the freshman placement tests will meet the distribution requirement by passing Engl. 3a and 3b, Types of World Literature, six semester hours. Three extra hours of composition, carrying no credit toward graduation, must be taken and passed by those whose preparation, as evidenced by the placement tests, has been poor.

FOREIGN LANGUAGES. Students in the College of Arts and Science normally are required to complete successfully the equivalent of two years of college work in one foreign language beyond the elementary level, the latter term being understood to mean two years in secondary school or one year in college. The requirement may be met either by passing an examination or by pursuing in course the language to be used in satisfaction of the requirement. Students who present at entrance three or four years of a foreign language may meet this requirement with one year of advanced college work.

An option is offered those who find it necessary or, as part of their preparation for chosen fields of endeavor, desirable to pursue in college the study of foreign languages other than the language or languages studied in secondary school. Such students may offer in satisfaction of the language requirement two years of one foreign language and one year of another.

FINE ARTS OR MUSIC. Three semester hours.

PHILOSOPHY OR RELIGION. Three semester hours.

GROUP II

SCIENCE. Twelve semester hours, chosen from at least three of the following fields: astronomy, biology, chemistry, geology, mathematics, physics, psychology.

Normally, a student will take work in fields not represented among those studied in secondary school. However, if work taken in secondary school is not regarded as being the equivalent of prerequisites of courses which the student expects to take later, he will take the Lehigh courses specified as prerequisites, and full credit for the latter will be given toward the satisfaction of the distribution requirement.

GROUP III

SOCIAL SCIENCE. Twelve semester hours, chosen from at least three of the following fields: ancient civilization, economics, education, government, history, international relations, sociology.

Concentration Requirements

During the second semester of the freshman year each student must select some sequence of studies as his major field. A major consists of at least twelve semester hours of advanced work in the field chosen. Including preliminary college work, the minimum number of hours constituting a major is twenty-four. Change of major is permitted up to the end of the sophomore year. Majors must be approved by the professors concerned and the dean of the College.

The major work is designed to enable a student to master his chosen field so far as that is possible in the two years devoted to the subject. In all fields certain courses are prescribed, but the mere passing of courses will not satisfy the major requirements. It is expected that the student will read widely in his subject and prepare himself largely through his own reading and his own independent work for his final comprehensive examination. After a student has selected a major subject, the head of the department in which the major is selected becomes the official adviser of the student and guides him in his choice of courses.

COMPREHENSIVE EXAMINATION

A comprehensive examination in the major subjects is required of all students. This examination is given at the end of the senior year and may be oral or written or both. The comprehensive examination is given under the direction of the head of the major department. At least two university teachers and, whenever possible, representatives of at least two departments take part in the examination.

No student is allowed to take the senior comprehensive examination more than twice in any one field. In case of failure on the first attempt, a second trial is not permitted until a period of three months has passed.

UNSCHEDULED WORK

On the advice of the head of the department in which the major work is being done and with the consent of the dean of the College, a senior of unusual merit who wishes to concentrate in his chosen field may be allowed to substitute not more than six hours of unscheduled work per semester for six hours of other work required for graduation.

SPECIAL HONORS

Special honors are awarded at the end of the senior year, on recommendation of the head of the department concerned and by vote of the faculty, to students who have done advanced work of unusual merit in some chosen field. Candidates for special honors must indicate during their junior year their intention to work for such honors. Awards are based on grades obtained in the subject chosen, the results in extra work assigned, and the general proficiency of the candidate as evidenced by either a final examination or a thesis, as the head of the department involved may direct. No student who fails to pass his comprehensive examination with distinction is graduated with special honors.

SPECIAL REGULATIONS FOR ENGLISH

Students in the College of Arts and Science who persistently use poor English may be reported at any time to the dean of the College. He may require that they take additional English without credit toward graduation.

Toward the end of the junior year each junior in the College of Arts and Science must report to the department of English for an exercise in impromptu writing. Students found seriously deficient in this test are reported to the dean of the College, who may require that they take additional English without credit toward graduation.

DETAILS OF CONCENTRATION REQUIREMENTS

Major Sequences

Biology. Three majors are offered by the department of biology: zoology, botany, and bacteriology.

Zoology. This major is designed for men who intend to enter medical school or to continue advanced instruction in a graduate school.

Required Courses: Elementary

Biol. 31, 32.	Zoology	(6)

Required Courses: Advanced

Biol. 3.	Comparative Anatomy	(3)
Biol. 4.	Embryology	(3)
Biol. 6.	Botany	(3)
Biol. 18.	Genetics	(2)
Biol. 20.	Physiology	(3)
Biol. 61, 62.	Bacteriology	(6)
Biol. 113.	Histology	(3)
Biol. 158.	Immunology	(3)

Botany. This major is for men who intend to enter the teaching profession, or to do research in agriculture or in the economic phases of the science.

Required Courses: Elementary

Biol. 31, 32.	Zoology	(6)

Required Courses: Advanced

Biol. 6.	Botany	(3)
Biol. 18.	Genetics	(2)
Biol. 36.	Economic Botany	(3)
Biol. 61, 62.	Bacteriology	(6)

Bacteriology. This major is for men who intend to go into public health work or bacteriology either upon graduation or in pursuance of graduate study.

Required Courses: Elementary

Biol. 31, 32.	Zoology	(6)

Required Courses: Advanced

Biol. 6.	Botany	(3)
Biol. 18.	Genetics	(2)
Biol. 61, 62.	Bacteriology	(6)
Biol. 113.	Histology	(3)
Biol. 158.	Immunology	(3)

Suggested Electives

Biol. 155.	Industrial Bacteriology	(3)
Biol. 161.	Public Sanitation	(3)

Collateral Courses Required of All Majors

Chem. 4.	General Chemistry	(4)
Chem. 5.	General Chemistry	(4)
Chem. 33.	Analytical Chemistry	(3)
Chem. 43.	Analytical Chemistry Conference	(1)
Chem. 93.	Elements of Physical Chemistry	(3)
Chem. 150.	Organic Chemistry	(3)
Chem. 151.	Organic Chemistry	(3)
Chem. 165.	Organic Chemistry Laboratory	(2)
Phys. 12.	Introduction to Physics	(3)
Phys. 16.	General Physics	(3)
Phys. 17.	General Physics Laboratory	(2)

A reading knowledge of both French and German should be attained before graduation.

CHEMISTRY.

Required Courses: Elementary

Chem. 4, 5.	General Chemistry	(8)

Required Courses: Advanced

Chem. 33, 34.	Analytical Chemistry	(6)
Chem. 43, 44.	Analytical Chemistry Conference	(2)
Chem. 91.	Physical Chemistry	(3)
Chem. 92.	Physical Chemistry Laboratory	(1)
Chem. 102.	Inorganic Chemistry	(3)
Chem. 150, 151.	Organic Chemistry	(6)
Chem. 165, 167.	Organic Chemistry Laboratory	(4)
Chem. 190.	Physical Chemistry	(3)
Chem. 192.	Physical Chemistry Laboratory	(1)
Chem. 194.	Physical Chemistry and Electrochemistry	(3)
Chem. 197.	Electrochemistry Laboratory	(1)

Required Collateral Courses

Math. 11.	Algebra and Analytic Geometry	(3)
Math. 12.	Analytic Geometry and Calculus	(3)
Math. 13.	Calculus	(3)
Phys. 12.	Introduction to Physics	(3)
Phys. 16.	General Physics	(3)
Phys. 17.	General Physics Laboratory	(2)

Suggested Electives

Chem. 137.	Advanced Analytical Chemistry	(3)
Chem. 157.	Qualitative Organic Analysis	(3)
Chem. 158.	Advanced Organic Chemistry	(3)
Chem. 171.	Industrial Biochemistry	(3)

CLASSICAL LANGUAGES. Students who select Greek and Latin as a major will choose one of two groups of courses:

Group 1 (Emphasis upon Greek).

Required Courses: Elementary

Gk. 1, 2.	Elementary Greek	(6)
Gk. 3, 4.	Second-Year Greek	(6)

Required Courses: Advanced

Gk.	7.	Thucydides	(3)
Gk.	8.	Greek Tragedy	(3)
Gk.	15.	Homer and Herodotus	(3)
Gk.	16.	Plato	(3)
Gk.	21.	Ancient History	(3)
Gk.	100.	Greek Literature in English Translation	(3)
Lat.	125.	Latin Literature in English Translation	(3)

Six hours of Latin language and literature, specific courses depending upon the student's preparation.

Suggested Electives

F.A.	3.	History of Architecture	(3)
F.A.	11.	Ancient and Medieval Art	(3)

Any course listed under Latin for which the student is prepared.

Group 2 (Emphasis upon Latin).

Required Courses: Elementary

Lat.	1a.	Pliny	(3)
Lat.	2.	Horace	(3)

Required Courses: Advanced

Lat.	4.	Livy	(3)
Lat.	13.	Latin Drama	(3)
Lat.	22.	Ancient History	(3)
Lat.	105.	Satire	(3)
Lat.	106.	Roman Prose Writers of the Empire	(3)
Lat.	125.	Latin Literature in English Translation	(3)
Gk.	1, 2.	Elementary Greek	(6)
Gk.	21.	Ancient History	(3)
Gk.	100.	Greek Literature in English Translation	(3)

Suggested Electives

F.A.	3.	History of Architecture	(3)
F.A.	11.	Ancient and Medieval Art	(3)

Any course listed under Greek for which the student is prepared.

CONSERVATION.

Required Courses

Biol.	6,	Botany	(3)
Biol.	18.	Genetics	(2)
Biol.	31, 32.	Zoology	(6)
Biol.	36.	Economic Botany	(3)
Biol.	61.	Bacteriology	(3)
Biol.	106.	Natural History and Ecology	(3)
		Soil Microbiology	(3)
		Conservation Problems	(3)
		Ornithology Mammalogy Icthyology Entomology	(3)
Chem.	4, 5.	General Chemistry	(8)
Chem.	33, 34.	Analytical Chemistry	(6)
Chem.	150, 151.	Organic Chemistry	(6)
C.E.	6.	Land and Topographic Surveying	(3)
Geol.	1,	Principles of Geology	(3)
Geol.	12.	Historical Geology	(3)
Geol.	31.	Mineralogy	(3)
Geol.	32.	Petrology	(3)
Geol.	143.	Cartography	(1)
Geol.	161, 162.	Earth Science Applied to Conservation	(6)
Geol.	171.	Meterology	(3)
Geol.	172.	Climatology	(3)
Math.	1.	Trigonometry	(3)
Phys.	12.	Introduction to Physics	(3)
Phys.	16.	General Physics	(3)

ECONOMICS AND BUSINESS ADMINISTRATION. Four majors are offered in the field of economics and business administration: social institutions, economics, finance, and accounting.

Social Institutions.

Required Courses: Elementary

SOPHOMORE YEAR

Eco.	3, 4.	Economics	(6)

Required Courses: Advanced

JUNIOR YEAR

Eco.	107, 108.	Advanced Economics	(6)
E.S.	145.	Statistical Method	(3)
E.S.	146.	Business Cycles and Forecasting	(3)
Fin.	126.	Public Finance	(3)
Soc.	51.	Social Institutions	(3)

SENIOR YEAR

Eco.	133, 134.	Labor Problems	(6)
Soc.	161, 162.	Sociology and Social Problems	(6)
Soc.	171, 172.	Readings in Sociology	(6)

Suggested Electives

Eco.	135.	Transportation	(3)
Eco.	136.	Public Utilities	(3)
Govt.	157.	Municipal Government	(3)
Govt.	158.	Municipal Administration	(3)
Journ.	18.	History of American Journalism	(3)
Psych.	104.	Social Psychology	(3)

Economics.

Required Courses: Elementary

SOPHOMORE YEAR

Eco.	3, 4.	Economics	(6)

Required Courses: Advanced

JUNIOR YEAR

Eco.	106.	Intermediate Economic Theory	(3)
Eco.	107, 108.	Advanced Economics	(6)
E.S.	145.	Statistical Method	(3)
E.S.	146.	Business Cycles and Forecasting	(3)
Fin.	29, 30.	Money and Banking	(6)

SENIOR YEAR

Eco.	133.	Labor Problems	(3)
Eco.	136.	Public Utilities	(3)
Fin.	41.	Foreign Trade	(3)
Fin.	127.	Public Finance	(3)
Soc.	162.	Social Problems	(3)

Suggested Electives

Eco.	11.	Marketing	(3)
Eco.	135.	Transportation	(3)
E.S.	147.	National Income Analysis	(3)
Govt.	157.	Municipal Government	(3)
Govt.	158.	Municipal Administration	(3)
I.E.	2, 3.	Industrial Management	(6)
Soc.	161.	Sociology	(3)

Finance.

Required Courses: Elementary

SOPHOMORE YEAR

Eco.	3, 4.	Economics	(6)

Required Courses: Advanced

JUNIOR YEAR

E.S.	145.	Statistical Method	(3)
E.S.	146.	Business Cycles and Forecasting	(3)
Fin.	25, 26.	Corporation Finance	(6)
Fin.	29, 30.	Money and Banking	(6)

SENIOR YEAR

Eco.	60.	Insurance	(3)
Eco.	133 or 134.	Labor Problems	(3)
Fin.	41, 42.	International Trade and Finance	(6)
Fin.	123.	Investments	(3)
Fin.	127.	Public Finance	(3)

Suggested Electives

Acctg.	1, 2.	Accounting	(6)
Acctg.	113, 114.	Intermediate Accounting	(6)
Eco.	107, 108.	Advanced Economics	(6)
Eco.	133 or 134.	Labor Problems	(3)
Fin.	131.	Bank Credit Problems	(3)
Fin.	132.	Monetary and Credit Policies	(3)
Fin.	171, 172.	Readings in Finance	(6)

Accounting.

Required Courses: Elementary

SOPHOMORE YEAR

Acctg.	1, 2.	Accounting	(6)
Eco.	3, 4.	Economics	(6)

Required Courses: Advanced

JUNIOR YEAR

Acctg.	113, 114.	Intermediate Accounting	(6)
Acctg.	115.	Cost Accounting	(3)
Acctg.	118.	Advanced Cost Accounting	(3)
Fin.	25, 26.	Corporation Finance	(6)

SENIOR YEAR

Acctg.	119.	Specialized Accounting Systems	(3)
Acctg.	120.	Auditing	(3)
Law	1, 2.	Business Law	(6)
Law	103.	Federal Tax Law	(3)

Suggested Electives

Eco.	106.	Intermediate Economic Theory	(3)
E.S.	145.	Statistical Method	(3)
E.S.	146.	Business Cycles and Forecasting	(3)
Fin.	123.	Investments	(3)

EDUCATION.

Required Courses: Elementary

Educ.	1.	Introduction to Education	(3)
Educ.	20.	Educational Psychology	(3)

Required Courses: Advanced

Educ.	51.	Principles of High School Teaching	(3)
Educ.	53.	Observation of Secondary School Teaching	(3)
Educ.	54.	Practice Teaching of Secondary School Subj.	(3)
Educ.	131.	History of Education in the United States	(3)
Educ.	150.	Principles of Secondary Education	(3)
Educ.	151.	Organization of Materials of Instruction	(3)
		Electives	(6)

ENGLISH. Three majors are offered by the department of English: English literature, English and journalism, and journalism.

English Literature. Students looking forward to teaching English or taking graduate courses for advanced degrees should select this major.

Required Courses: Elementary

Engl. 1, 2.	Composition and Literature	(6)
or		
Engl. 3a, 3b,	Types of World Literature	(6)

and six semester hours from the following courses:

Engl. 4, 5.	A Study of the Drama	(6)
Engl. 8, 9.	English Literature	(6)
Engl. 20, 21.	American Literature	(6)
Engl. 35,	Types of Poetry	(3)
Engl. 3a, 3b.	Types of World Literature	(6)

Required Courses: Advanced

Engl. 123, 124.	Shakespeare and the Elizabethan Drama	(6)

and eighteen semester hours from the following courses:

Engl. 83, 84.	Readings in English Literature	(6)
Engl. 121.	Contemporary American Literature	(3)
Engl. 122.	Contemporary English Literature	(3)
Engl. 125.	English Literature of the Romantic Era	(3)
Engl. 126.	English Literature of the Victorian Era	(3)
Engl. 131.	Milton	(3)
Engl. 133.	Restoration and Augustan Literature	(3)
Engl. 134.	The Age of Johnson	(3)
Engl. 135.	History of the English Language	(3)
Engl. 136.	Writing for Publication	(3)
Engl. 137.	The Renaissance	(3)
Engl. 138.	The Seventeenth Century	(3)

Students planning to pursue graduate studies should have a reading knowledge of German, French, and Latin.

English and Journalism. Students interested in a major which stresses writing techniques should select twenty-four hours from the group below, twelve hours to be in literature courses. Such students must complete Journ. 11 and 17. Students wishing to prepare a thesis for honors should elect in addition Engl. 81, 82.

Engl. 8, 9.	English Literature	(6)
Engl. 18, 19.	The Novel	(6)
Engl. 20.	American Literature, 1607-1855	(3)
Engl. 21.	Modern American Literature	(3)
Engl. 35.	Types of Poetry	(3)
Engl. 36.	Masterpieces of World Literature	(3)
Engl. 83, 84.	Readings in English Literature	(6)
Engl. 121.	Contemporary American Literature	(3)
Engl. 122.	Contemporary English Literature	(3)
Engl. 123, 124.	Shakespeare and the Elizabethan Drama	(6)
Engl. 125.	English Literature of the Romantic Era	(3)
Engl. 126.	English Literature of the Victorian Era	(3)
Journ. 11, 12.	Newspaper Reporting and Writing	(6)
Journ. 15.	Editorial Writing	(3)
Journ. 17.	Writing Special Feature Articles	(3)
Journ. 18.	History of American Journalism	(3)
Journ. 21, 22.	Creative Writing	(6)
Journ. 23.	Editing the House Organ and Trade Publication	(1)

Journalism.

Required Courses: Elementary

Engl. 1, 2.	Composition and Literature	(6)
or		
Engl. 3a, 3b.	Types of World Literature	(6)
	English Literature	(6)
Journ. 1-4.	Brown and White, four semesters	(4)

Required Courses: Advanced

Journ. 11.	Newspaper Reporting and Writing	(3)
Journ. 12.	Advanced Newspaper Reporting and Writing	(3)
Journ. 13.	Newspaper Editing and Copyreading	(3)
Journ. 18.	History of American Journalism	(3)
Journ. 15.	Editorial Writing	(3)
Journ. 16.	Newspaper Problems and Policies	(3)
Journ. 20.	Journalism Proseminar	(3)
Journ. 21.	Creative Writing	(3)

Suggested Electives

Journ. 14.	News Photography	(3)
Journ. 23.	Editing the House Organ and Trade Publication	(1)
Journ. 31, 32.	Community Journalism	(6)
Eco. 3, 4.	Economics	(6)
Eco. 11.	Marketing	(3)
Eco. 113.	Advertising	(3)
Eco. 133, 134.	Labor Problems	(6)
Govt. 51.	American National Government	(3)
Govt. 52.	American State Government	(3)
Govt. 157.	Municipal Government	(3)
Govt. 158.	Municipal Administration	(3)
Hist. 25, 26.	European History	(6)
Hist. 129, 130.	American Foreign Policy	(6)
Soc. 161.	Sociology	(3)
Soc. 162.	Social Problems	(3)

FINE ARTS.

Required Courses: Elementary

F.A. 11.	Ancient and Medieval Art	(3)
F.A. 12.	The Art of the Italian Renaissance	(3)

Required Courses: Advanced

F.A. 3, 4.	History of Architecture	(6)
F.A. 13.	The Art of the Northern Renaissance	(3)
F.A. 14.	Modern Art	(3)
F.A. 17, 18.	Criticism and Analysis of Art	(6)

Suggested Electives

F.A. 5, 6.	Freehand Drawing	(6)
F.A. 25.	Landscape Painting	(3)
F.A. 26.	Creative Painting	(3)
Mus. 13, 14.	Introduction to Music Literature	(6)
Phil. 151.	Esthetics	(3)

Courses in History and Foreign Language.

GEOLOGY.

Required Courses: Elementary

Geol. 1.	Principles of Geology	(3)
Geol. 12.	Historical Geology	(3)
Geol. 31.	Mineralogy	(3)
Geol. 32.	Petrology	(3)
Geol. 33.	Blowpipe Analysis	(1)

Required Courses: Advanced

Geol. 111.	Paleontology	(3)
Geol. 112.	Stratigraphy and Sedimentation	(3)
Geol. 121.	Structural Geology	(3)
Geol. 141.	Field Geology	(3)
Geol. 142.	Field Trip	(1)
Geol. 144.	Field Trip	(1)
Geol. 145.	Cartography	(1)
Geol. 151.	Mineral Resources	(3)
Geol. 152.	Mineral Resources	(3)

Suggested Electives

Math. 1.	Trigonometry	(3)
C.E. 3.	Mechanical Drawing	(3)
C.E. 6 or 6a.	Land and Topographic Surveying	(4-3)
Geol. 131.	Optical Crystallography	(3)
Geol. 132.	Petrography	(3)
Geol. 171.	Meteorology	(3)
Geol. 172.	Climatology	(3)
Geol. 181.	Geological Problems	(1-4)
Geol. 182.	Geological Problems	(1-4)
Chem. 4, 5.	General Chemistry	(8)
Phys. 12.	Introduction to Physics	(3)
Phys. 16.	General Physics	(3)
Min. 15.	Mining Engineering	(3)
Met. 21.	Engineering Metallurgy	(2)

Certain variations in the major courses and the suggested electives may be made, depending upon the branch of geology in which the student is interested. A reading knowledge of French and German is recommended.

GERMAN.

Required Courses

Ger. 9.	Advanced German	(3)
Ger. 10.	Goethe's Faust	(3)
Ger. 22.	Conversation and Composition	(3)
Ger. 111, 112.	Nineteenth Century German Drama	(6)
Ger. 113, 114.	Lessing, Goethe, and Schiller	(6)
Ger. 115, 116.	The German Short Story	(6)

Suggested Electives

Hist. 25, 26.	European History	(6)
or		
Hist. 131, 132.	Intellectual Expansion of Modern Europe	(6)

In addition, the student will be expected to have a knowledge of the history of German literature. A list of readings in English and German is furnished the student at the beginning of his major work.

GREEK.

Required Courses: Elementary

Gk. 1, 2.	Elementary Greek	(6)
Gk. 3, 4.	Second-Year Greek	(6)

Required Courses: Advanced

Gk. 7.	Thucydides	(3)
Gk. 8.	Greek Tragedy	(3)
Gk. 15.	Homer and Herodotus	(3)
Gk. 16.	Plato	(3)
Gk. 21.	Ancient History	(3)
Gk. 100.	Greek Literature in English Translation	(3)
Lat. 125.	Latin Literature in English Translation	(3)

and six hours of Latin language and literature, specific courses depending upon the student's preparation.

Suggested Electives

F.A.	3.	History of Architecture	(3)
F.A.	11.	Ancient and Medieval Art	(3)

Any course listed under Latin for which the student is prepared.

HISTORY AND GOVERNMENT. Four majors are offered by the department of history and government: American history, European history, government, and a general major.

American History. Students looking forward to teaching American history, or taking graduate work leading to the doctorate* in this field should select this major. This major is also appropriate for the students who are contemplating studying law or entering certain branches of government service.

Required Courses: Elementary

Hist.	13, 14.	United States History	(6)

Required Courses: Advanced

Hist.	129, 130.	American Foreign Policy	(6)
Govt.	51, 52.	American Government (National and State)	(6)

and fifteen semester hours to be selected from the following:

Hist.	27, 28.	European Expansion and Empire Building	(6)
Hist.	119.	Eighteenth Century European Civilization	(3)
Hist.	120.	Eighteenth Century European Imperialism	(3)
Hist.	149, 150.	Hispanic America in the Nineteenth and Twentieth Centuries	(6)
Hist.	151.	Pro-Seminar in United States and Pennsylvania History	(3)
Hist.	160.	History of American Political Parties	(3)
Govt.	2.	American Political Ideas	(3)
Govt.	4.	Political Parties and Electoral Problems	(3)
Govt.	151.	Constitutional Law	(3)

Suggested Electives

Eco.	3, 4.	Economics	(6)
Eco.	50.	Economic Geography	(3)
Hist.	25, 26.	European History	(6)
Int. Rel.	161, 162.	International Law	(6)
Psych.	1.	Elementary Psychology	(3)
Soc.	51.	Social Institutions	(3)

European History. Students looking forward to teaching European history, or taking graduate work leading to the doctorate* in this field should select this major. This major is also appropriate for the students who are contemplating studying law or entering the diplomatic service.

Required Courses: Elementary

Hist.	25, 26.	European History	(6)
Govt.	3.	Foreign Governments	(3)

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*Students who are planning to obtain the doctorate in history or political science should have a reading knowledge of two foreign languages. The languages likely to be required are French, German, or Spanish.

Required Courses: Advanced

Hist.	115, 116.	Political and Social History of England	(6)
Hist.	119.	Eighteenth Century European Civilization	(3)
Hist.	120.	Eighteenth Century European Imperialism	(3)

plus nine semester hours to be selected from the following:

Hist.	27, 28.	European Expansion and Empire Building	(6)
Hist.	29, 30.	Modern European History	(6)
Hist.	131, 132.	Intellectual Expansion of Modern Europe	(6)
Hist.	141, 142.	Expansion of the English-Speaking Peoples	(6)
Govt.	1.	Foundations of Government	(3)

and three semester hours to be selected from the following:

Govt.	163, 164.	Contemporary Political Thought	(6)
Hist.	117, 118.	The Middle East in World History	(6)
Int. Rel.	11, 12.	Diplomacy of Europe	(6)
Int. Rel.	31, 32.	Diplomacy of Russia and the Middle East	(6)
Int. Rel.	141, 142.	International Relations	(6)
Int. Rel.	161, 162.	International Law	(6)

Suggested Electives

Eco.	3, 4.	Economics	(6)
Govt.	51, 52.	American Government (National and State)	(6)
Hist.	129, 130.	American Foreign Policy	(6)
Int. Rel.	132.	Russia in World Affairs	(3)
Soc.	51.	Social Institutions	(3)

Government. Students looking forward to teaching civics and political science, or taking graduate work leading to the doctorate* in political science should select this major. This major is also appropriate for the students who are contemplating studying law, entering the government service, or engaging in research in the governmental field.

Required Courses: Elementary

Govt.	1.	Foundations of Government	(3)
Govt.	2.	American Political Ideas	(3)

Required Courses: Advanced

Govt.	3.	Foreign Governments	(3)
Govt.	51, 52.	American Government (National and State)	(6)
Govt.	157.	City Government	(3)
Govt.	160.	Public Administration	(3)
Govt.	163, 164.	Contemporary Political Thought	(6)

and six semester hours to be selected from the following:

Govt.	4.	Political Parties and Electoral Problems	(3)
Govt.	151.	Constitutional Law	(3)
Hist.	13, 14.	United States History	(6)
Hist.	115, 116.	Political and Social History of England	(6)
Hist.	129, 130.	American Foreign Policy	(6)
Hist.	131, 132.	Intellectual Expansion of Europe	(6)
Int. Rel.	141, 142.	International Relations	(6)
Int. Rel.	151, 152.	International Organization	(6)
Int. Rel.	161, 162.	International Law	(6)

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*Students who are planning to obtain the doctorate in history or political science should have a reading knowledge of two foreign languages. The languages likely to be required are French, German, or Spanish.

Suggested Electives

Fin.	127.	Public Finance	(3)
Hist.	25, 26.	European History	(6)
Psych.	104.	Social Psychology	(3)
Soc.	161.	Sociology	(3)
Soc.	162.	Social Problems	(3)

General Major. Students looking forward to teaching the social sciences in the public schools should take this major.

Required Courses: Elementary

Hist.	13, 14.	United States History	(6)
Hist.	25, 26.	European History	(6)
Govt.	1.	Foundations of Government	(3)

Required Courses: Advanced

Hist.	115, 116.	Political and Social History of England	(6)
Govt.	51.	American National Government	(3)

plus six semester hours to be selected from the following:

Hist.	117, 118.	The Middle East in World History	(6)
Hist.	119, 120.	Eighteenth Century European Civilization	(6)
Hist.	141, 142.	Expansion of the English-speaking Peoples	(6)
Hist.	129, 130.	American Foreign Policy	(6)
Hist.	131, 132.	Intellectual Expansion of Modern Europe	(6)
Govt.	3.	Foreign Governments	(3)
Govt.	163, 164.	Contemporary Political Thought	(6)

and three semester hours to be selected from the following:

Hist.	29, 30.	Modern European History	(6)
Int. Rel.	11, 12.	Diplomacy of Europe	(6)
Int. Rel.	21, 22.	Diplomacy of the Far East Since 1800	(6)
Int. Rel.	31, 32.	Diplomacy of Russia and the Middle East	(6)
Int. Rel.	151, 152.	International Organization	(6)
Int. Rel.	161, 162.	International Law	(6)

Suggested Electives

Eco.	3, 4.	Economics	(6)
Eco.	50.	Economic Geography	(3)
Int. Rel.	112.	The World Since 1919	(3)
Int. Rel.	141, 142.	International Relations	(6)
Soc.	50.	Social Institutions	(3)

INTERNATIONAL RELATIONS. This major is designed for men aspiring to the United States Foreign Service, to journalism on the international plane, to commercial employment abroad, or to advanced study in the field, and for those whose intellectual interests lie across national frontiers. Students contemplating a career in the United States Foreign Service are advised to continue language study throughout their course.

Required Courses: Elementary

Int. Rel.	1, 2.	Diplomacy	(6)

Required Courses: Advanced

Int. Rel.	141, 142.	International Relations	(6)
Int. Rel.	151, 152.	International Organization	(6)

and twelve semester hours to be selected from the following:

Int. Rel. 11, 12.	Diplomacy of Europe	(6)
Int. Rel. 21, 22.	Diplomacy of the Far East	(6)
Int. Rel. 31, 32.	Diplomacy of Russia and the Middle East	(6)
Int. Rel. 112.	The World Since 1919	(3)
Int. Rel. 122.	The Far East Since 1919	(3)
Int. Rel. 132.	Russia in World Affairs	(3)
Int. Rel. 161, 162.	International Law	(6)
Hist. 117, 118.	The Middle East in World History	(6)
Hist. 129, 130.	American Foreign Policy	(6)
Hist. 149, 150.	Hispanic-America in the Nineteenth and Twentieth Centuries	(6)
Govt. 3.	Foreign Governments	(3)
Govt. 51.	American National Government	(3)
Govt. 163, 164.	Contemporary Political Thought	(6)

Suggested Electives

Acctg. 4.	Accounting for Engineers	(3)
Eco. 3, 4.	Economics	(3)
Eco. 50.	Economic Geography	(3)
E.S. 145.	Statistical Method	(3)
Fin. 25.	Corporation Finance	(3)
Fin. 41, 42.	International Trade	(3)
Govt. 1.	Foundations of Government	(3)
Hist. 13, 14.	United States History	(6)
Hist. 25, 26.	European History	(6)
Hist. 29, 30.	Modern Europe	(6)
Hist. 132.	Intellectual Expansion of Modern Europe	(6)
Hist. 142.	Expansion of English-Speaking Peoples	(6)
Hist. 127, 128.	Development of American Institutions	(6)
Psych. 4.	Elementary Social Psychology	(3)

LATIN.

Required Courses: Elementary

Lat. 12.	Pliny	(3)
or		
Lat. 1b.	Vergil	(3)
Lat. 2.	Horace	(3)

Required Courses: Advanced

Lat. 4.	Livy	(3)
Lat. 13.	Latin Drama	(3)
Lat. 105.	Satire	(3)
Lat. 106.	Roman Prose Writers of the Empire	(3)
Lat. 107.	Aeneid, Books VII-XII	(3)
Lat. 108.	Lucretius	(3)
Lat. 125.	Latin Literature in English Translation	(3)

Suggested Electives

Gk. 21.	Ancient History	(3)
Lat. 22.	Ancient History	(3)
Lat. 121.	The Roman Republic	(3)
Lat. 122.	The Roman Empire to the Death of Marcus Aurelius	(3)

MATHEMATICS AND ASTRONOMY. Three majors are offered by the department of mathematics: mathematics, mathematics and astronomy, and actuarial science.

Mathematics.

Required Courses: Elementary

Math. 11.	Algebra and Analytic Geometry	(3)
or		
Math. 11a.	Solid Geometry and Analytic Geometry	(3)
Math. 12.	Analytic Geometry and Calculus	(3)
Math. 13.	Calculus	(3)
Math. 14.	Intermediate Calculus	(3)

Required Courses: Advanced

Math. 51.	Advanced Algebra	(3)
Math. 109, 110.	Principles of Analysis	(6)
Math. 115.	Theory of Functions of a Complex Variable	(3)

Nine additional hours, at least six of which shall be from the "100" group in mathematics.

Mathematics and Astronomy.

Required Courses: Elementary

Astr. 1.	Descriptive Astronomy	(3)
Math. 11.	Algebra and Analytic Geometry	(3)
or		
Math. 11a.	Solid Geometry and Analytic Geometry	(3)
Math. 12.	Analytic Geometry anl Calculus	(3)
Math. 13.	Calculus	(3)
Math. 14.	Intermediate Calculus	(3)

Required Courses: Advanced

Astr. 2.	General Astronomy	(3)
Astr. 3.	Practical Astronomy	(3)
Astr. 4.	Stellar Astronomy and Astrophysics	(3)
Math. 109, 110.	Principles of Analysis	(6)

Three additional hours, from the "100" group in mathematics.

Actuarial Science.

Required Courses: Elementary

Math. 11.	Algebra and Analytic Geometry	(3)
or		
Math. 11a.	Solid Geometry and Analytic Geometry	(3)
Math. 12.	Analytic Geometry and Calculus	(3)
Math. 13.	Calculus	(3)
Math. 14.	Intermediate Calculus	(3)
Math. 40.	Mathematics of Finance	(3)

Required Courses: Advanced

Math. 42.	Introduction to Mathematics of Statistics	(3)
Math. 43.	First Course in Math. of Life Ins.	(3)
Math. 51.	Advanced Algebra	(3)
Math. 102.	Finite Differences	(3)
Math. 123.	Probability	(3)

Suggested Electives

Acct. 1, 2.	Accounting	(6)
Eco. 3, 4.	Economics	(6)
Eco. 107, 108.	Advanced Economics	(6)
Fin. 25.	Corporation Finance	(3)

PHILOSOPHY.

Required Courses: Elementary

Phil. 14.	Logic and Scientific Method	(3)
Psych. 1.	Elementary Psychology	(3)

Required Courses: Advanced

Phil. 131.	Ancient and Medieval Philosophy	(3)
Phil. 132.	Modern Philosophy	(3)
Phil. 137.	Nineteenth Century Philosophy	(3)

Twelve additional hours, at least six of which are to be chosen from advanced courses in philosophy, and not more than six of which are to be chosen from the following list:

Eco. 107.	Advanced Economics	(3)
Eco. 108.	Advanced Economics	(3)
Eco. 171.	Readings in Economics	(3)
Eco. 172.	Readings in Economics	(3)

Soc.	171.	Readings in Sociology	(3)
Educ.	137.	History of Education in Europe	(3)
F.A.	17.	Criticism and Analysis of Art	(3)
F.A.	18.	Criticism and Analysis of Art	(3)
Gk.	16.	Plato	(3)
Hist.	131.	Intellectual Expansion of Europe	(3)
Govt.	163.	Contemporary Political Thought	(3)
Govt.	164.	Contemporary Political Thought	(3)
Math.	103.	Mathematical Logic	(3)
Psych.	120.	History of Psychology	(3)

PHYSICS.

Required Courses: Elementary

Math. 11.	Algebra and Analytic Geometry	(3)	
Math. 12.	Analytic Geometry and Calculus	(3)	
Math. 13.	Calculus	(3)	
Math. 14.	Intermediate Calculus	(3)	
Phys. 12.	Introduction to Physics	(3)	(9)
Phys. 16.	General Physics	(3)	
Phys. 17.	General Physics Laboratory	(3)	
or			
Phys. 22.	Mechanics and Properties of Matter	(4)	(12)
Phys. 23.	Heat, Sound, and Light	(4)	
Phys. 24.	Electricity and Magnetism	(4)	

Required Courses: Advanced

Math. 106.	Advanced Calculus	(3)
Phys. 110.	Electrical Laboratory	(1)
Phys. 111.	Electrical Laboratory	(1)
Phys. 120.	Electric Oscillations and Waves	(4)
Phys. 122.	Physical Optics and Spectroscopy	(4)
Phys. 124.	Electrical Discharge through Gases	(4)
Phys. 126.	Pyrometry	(2)
Phys. 160, 161.	Introduction to Modern Physical Theories	(6)
Phys. 162, 163.	Introductory Theory of Electricity and Magnetism	(6)
Phys. 164, 165.	Advanced Physics Laboratory	(2)
Phys. 166.	Special Topics in Physics	(1-3)
Phys. 170.	Spectroscopy	(2 or 3)

PSYCHOLOGY. A student may select one of four fields of specialization. These are primarily distinguished by the nature of the collateral courses advised for supporting the work in psychology. In general, majors in psychology start their concentration at the beginning of the junior year and devote as much time as possible during the first two years laying a foundation in basic sciences and mathematics. The first course in psychology is usually taken at the beginning of the sophomore year.

Preparatory Courses Required of all Majors

Phys. 12.	Introduction to Physics	(3)
Phys. 16.	General Physics *or the equivalent*	(3)
Chem. 15.	Elementary Chemistry *or the equivalent*	(3)
Math. 11.	Algebra and Analytic Geometry *or any higher course*	(3)
Biol. 31.	Zoology	(3)
Biol. 32.	Zoology	(3)
Biol. 18.	Genetics	(2)
Phil. 14.	Logic and Scientific Method	(3)

General Psychology. This sequence is designed for prospective teachers and research workers in psychology who expect to pursue graduate work after securing the baccalaureate degree.

Required Courses: Elementary

Psych.	1.	Elementary Psychology	(3)
Psych.	22.	General Applied Psychology	(3)

Required Courses: Advanced

Psych.	102.	Psychological Tests and Measurements	(3)
Psych.	104.	Social Psychology	(3)
Psych.	109.	Abnormal Psychology	(3)
Psych.	120.	History of Psychology	(3)
Psych.	129.	Physiological Psychology	(3)
Psych.	135.	Experimental Psychology	(3)
Psych.	136.	Experimental Psychology	(3)
Psych.	152.	Industrial Selection and Classification	(3)

Recommended Collateral Courses

Biol.	3.	Comparative Vertebrate Anatomy	(3)
Math.	131.	Statistical Mathematics	(3)

and nine hours of supporting electives

Personnel Psychology. This sequence is designated for majors who expect to enter industrial and business applications of psychology.

Required Courses: Elementary

Psych.	1.	Elementary Psychology	(3)
Psych.	4.	Elementary Social Psychology	(3)
Psych.	16.	Psychology in Business	(3)

Required Courses: Advanced

Psych.	51.	Readings in Psychology	(3)
Psych.	102.	Psychological Tests and Measurements	(3)
Psych.	109.	Abnormal Psychology (3)	(3)
or			
Psych.	117.	Personality (3)	
Psych.	129.	Physiological Psychology	(3)
Psych.	135.	Experimental Psychology	(3)
Psych.	136.	Experimental Psychology	(3)
Psych.	151.	Industrial Training and Work Control	(3)
Psych.	152.	Industrial Selection and Classification	(3)

Recommended Collateral Courses

Eco.	3.	Economics	(3)
Eco.	4.	Economics	(3)
Eco.	134.	Labor Problems	(3)
I.E.	13.	Elementary Industrial Engineering	(3)
I.E.	112.	Personnel Administration	(3)
I.E.	128.	Work Simplification	(3)

Preclinical Psychology. Certification for the practice of clinical psychology requires at least one year of graduate study and one year of internship beyond the baccalaureate degree. The following courses are designed to meet the entrance requirements of the principal clinical training centers.

Required Courses: Elementary

Psych.	1.	Elementary Psychology	(3)
Psych.	4.	Elementary Social Psychology	(3)
Psych.	22.	General Applied Psychology	(3)

Required Courses: Advanced

Psych. 102.	Psychological Tests and Measurements	(3)
Psych. 108.	Genetic Psychology	(3)
Psych. 109.	Abnormal Psychology	(3)
Psych. 120.	History of Psychology	(3)
Psych. 129.	Physiological Psychology	(3)
Psych. 135.	Experimental Psychology	(3)
Psych. 136.	Experimental Psychology	(3)
Psych. 152.	Industrial Selection and Classification	(3)

Recommended Collateral Courses

Biol. 3.	Comparative Vertebrate Anatomy	(3)
Biol. 52.	Bacteriology	(3)

and nine hours of supporting electives in chemistry, biology, or mathematics.

Social Service Psychology. This sequence is designed for majors who expect to enter work in public relations, community case work, guidance clinics, and advisory services in municipal centers.

Required Courses: Elementary

Psych. 1.	Elementary Psychology	(3)
Psych. 22.	General Applied Psychology	(3)

Required Courses: Advanced

Psych. 51.	Readings in Psychology	(3)
Psych. 104.	Social Psychology	(3)
Psych. 108.	Genetic Psychology	(3)
Psych. 109.	Abnormal Psychology	(3)
Psych. 129.	Physiological Psychology	(3)
Psych. 135.	Experimental Psychology	(3)
Psych. 136.	Experimental Psychology	(3)
Psych. 152.	Industrial Selection and Classification	(3)

Recommended Collateral Courses

Soc. 51.	Social Institutions	(3)
Soc. 161.	Sociology	(3)
Soc. 162.	Social Problems	(3)

and nine hours of electives in government, history, or economics.

ROMANCE LANGUAGES. Majors are offered in French and Spanish.

French.

Required Courses: Elementary

Fr. 1, 2.	Elementary French	(6)
Fr. 11, 12.	Intermediate French	(6)
Fr. 13, 14.	Types of French Literature	(6)

or the equivalents

Required Courses: Advanced

Fr. 21.	Seventeenth Century French Literature	(3)
and		
Fr. 22.	Eighteenth Century French Literature	(3)
or		
Fr. 31, 32.	Nineteenth Century French Literature	(6)
Fr. 101.	French Literature before the Seventeenth Century	(3)
Fr. 102.	Contemporary French Literature	(3)
Fr. 103, 104.	Proseminar	(6)

Suggested Electives

Engl. 123, 124.	Shakespeare and the Elizabethan Drama	(6)
Gk. 100.	Greek Literature in English Translation	(3)
Hist. 131, 132.	The Intellectual Expansion of Modern Europe	(6)
Lat. 125.	Latin Literature in English Translation	(3)

The student will be expected to complete supplementary readings, the list of which he will receive at the beginning of his major work, and to correlate the knowledge gained in courses and readings through the use of some recommended history of French literature.

Spanish.

Required Courses: Elementary

Span. 1, 2.	Elementary Spanish	(6)
Span. 11, 12.	Intermediate Spanish	(6)
Span. 21.	Introduction to Modern Spanish Fiction	(3)
Span. 22.	Introduction to Modern Spanish Drama	(3)

or the equivalents

Required Courses: Advanced

Span. 101.	Spanish Fiction of the Golden Age	(3)
Span. 102.	Spanish Drama of the Golden Age	(3)
Span. 103, 104.	Proseminar	(6)
Span. 111, 112.	Spanish-American Literature	(6)

Suggested Electives

Engl. 123, 124.	Shakespeare and the Elizabethan Drama	(6)
Gk. 100.	Greek Literature in English Translation	(3)
Hist. 131, 132.	The Intellectual Expansion of Modern Europe	(6)
Hist. 149, 150.	Hispanic America in the Nineteenth and Twentieth Centuries	(6)
Lat. 125.	Latin Literature in English Translation	(3)

In addition to the outside reading and reports required in connection with these courses, the student will be expected to acquire a knowledge of the history of Spanish literature as a whole.

The College of Business Administration

THE COLLEGE OF BUSINESS ADMINISTRATION

Administrative Officers

Martin Dewey Whitaker, *President*
Earl Kenneth Smiley, *Vice-President*
*Neil Carothers, *Dean of the College of Business Administration*
Carl Elmer Allen, *Acting Director of the Curriculum in Business Administration*
Wray Hollowell Congdon, *Dean of Students and Director of Admissions*
George Bartlett Curtis, *Registrar*

Faculty

Carl Elmer Allen	*Accounting*
Frederick Alden Bradford	*Finance*
Elmer Clark Bratt	*Economic Statistics*
Harvey Elliot Brazer	*Finance*
Anthony Joseph Bryski	*Economics and Sociology*
*Neil Carothers	*Economics and Sociology*
Roy Burford Cowin	*Accounting*
Richard Malone Davis	*Economics and Sociology*
Herbert Maynard Diamond	*Economics and Sociology*
Gordon Samuel Fyfe	*Economics and Sociology*
Hervey Devolzo Hotchkiss	*Finance*
John Edward Jacobi	*Economics and Sociology*
Finn Bjorn Jensen	*Economics and Sociology*
Louis Clayton Jurgensen	*Accounting*
Alfred Paul Koch	*Accounting*
Thomas Charles Kubelius	*Accounting*
Carl Leland Moore	*Accounting*
Robert Dennis Mustain	*Economic Statistics*
Vincent Aloysius Perry	*Finance*
Hugh Owen Roberts	*Accounting*
William Henry Williams Skerrett, Jr.	*Economics and Sociology*
Richard Walton Smith	*Economics and Sociology*
Max Donald Snider	*Economics and Sociology*
Frank Joseph Velesz	*Economics and Sociology*

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*Absent on leave 1948-1949.

THE COLLEGE OF BUSINESS ADMINISTRATION

The College of Business Administration, which is a member of the American Association of Collegiate Schools of Business, offers a program of study designed to provide thorough and systematic training in the fundamentals of business. More specifically, the College aims to develop in the student an intelligent understanding of business principles, an ability to analyze industrial facts, and habits of thought which will enable him to cope with the problems that increasing executive responsibilities will bring him in later life. Stress is on the building of a sound foundation, since it is the firm belief of the College that no substitute can be furnished for the training and experience provided by actual contact with the complex problems of modern business. Accordingly, the student's interests are best served by equipping him with those fundamental facts and insights which will make it possible for him to profit the more readily from practical experience after graduation.

In accordance with this plan of training in fundamentals, the student is required to learn the basic principles that underlie all business. No student is permitted to omit basic work in the principles and problems of economics, economic history, accounting, corporation finance, money and banking, marketing, business law, labor problems, and statistical method, which are essential for a career in all types of business enterprise. This insistence upon an acquaintance with the fundamentals of the broad field not only equips the student with the elementary requisites for a career in a variety of commercial and industrial enterprises but also gives him an invaluable means of discovering his real abilities and making a sound choice of a profession. A major function of the curriculum in business administration is to aid students in their efforts to discover their best talents, not only those individuals who enter college uncertain of their ultimate objectives but also those whose choice of a future profession or field of business may have been determined already but predicated upon inadequate grounds.

In addition to this principle of a generalized training in business fundamentals, the College regards as important the principle that the training as a whole shall offer an education commensurate with the standards of a university. The curriculum permits no student to devote himself exclusively to business subjects. He must acquire at least a rudimentary acquaintance with the cultural and humanitarian aspects of the world around him, and at least a brief contact with science. Consequently, a large part of the curriculum is devoted to work in liberal and scientific subjects. In the freshman year, only one course each semester is taken in the College of Business Administration. In the sophomore year, the curriculum offers only two courses each semester in business administration. Throughout the entire four years work there is emphasis on the social aspects of the subjects considered. If a student develops alongside his business work a special interest in some such field as languages, mathematics, or science, he is given opportunity, through electives, to pursue his special line.

In view of the breadth of training afforded by the variety of required and elective courses, satisfactory preparation for careers in fields other than commerce and industry is also available to students in the College of Business Administration. This is particularly true of law, for which business curricula of the better type are now recognized as excellent preliminary training. Lehigh University has been included by the leading law schools of the country among the institutions whose business curricula meet their admissions requirements.

Perhaps the most distinctive feature of the work in business administration at Lehigh is the character of the class work. Much of the work of the curriculum is taken in the College of Engineering and the College of Arts and Science, while students of these two divisions in very large numbers avail themselves of the courses given in the College of Business Administration. There is no segregation of students by colleges, and students in business administration take their courses in competition with students trained in liberal arts and in the exact sciences. This condition has a marked influence on the standards of work and the quality of the student.

Although emphasis is upon broad training, rather than specialization, the College recognizes that some degree of concentration is desirable after the student's interests may reasonably be expected to have crystallized. Accordingly, in the junior and senior years, every student is required to pursue a series of related courses in some more restricted field. Five fields of concentration are offered, viz.: accounting, economics, economic statistics, finance, and marketing. The detailed programs of study in each of the above fields are set forth on the following pages.

In times of normal business activity, students who have made creditable records may reasonably expect to receive one or more offers of positions before the date of their graduation. The College of Business Administration enjoys happy relations with many of the country's leading industries. Representatives regularly visit the campus to engage the services of students graduating in business administration. The University assumes no responsibility for finding positions for its graduates, but every effort is made by the College and by the university placement service to put its graduating students in touch with desirable opportunities for employment.

Students who entered the College of Business Administration prior to September 1947 are expected to meet the requirements as set forth in the March, 1948 *Register.* Students entering as freshmen in September, 1947 or thereafter should follow the curriculum as outlined below.

Graduates of this curriculum receive the degree of Bachelor of Science in Business Administration.

The Curriculum in Business Administration

Total hours required for degree of B.S. in Business Administration: 128

I. REQUIRED COURSES (59 hours)

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Acctg. 1	Accounting	3	Law 1	Business Law......	3
Acctg. 2	Accounting	3	Math. 1b	Gen. Math. for Bus.	3
Eco. 1	Ind. Evolution.....	3	Math. 40	Math. of Finance...	3
Eco. 3	Economics	3	Mil. 1	Military Science....	2
Eco. 4	Economics	3	Mil. 2	Military Science....	2
Eco. 11	Marketing	3	Mil. 3	Military Science....	2
Eco. 50	Economic Geography	3	Mil. 4	Military Science....	2
Eco. 133	Labor Problems....	3	Biol. 15	Freshman Hygiene..	—
Engl. 1	Composition & Lit..	3	P.E. 1	Physical Education..	—
or Engl. 3a	Types of World Lit.	3	P.E. 2	Physical Education..	—
Engl. 2	Composition & Lit..	3	P.E. 3	Physical Education..	—
or Engl. 3b	Types of World Lit.	3	P.E. 4	Physical Education..	—
E.S. 145	Statistical Method..	3	P.E. 5	Physical Education..	—
E.S. 146	Business Cycles....	3	P.E. 6	Physical Education..	—
Fin. 25	Corporation Finance	3	P.E. 7	Physical Education..	—
Fin. *	Money & Banking..	3	P.E. 8	Physical Education..	—

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* Students majoring in accounting, economic statistics, or marketing will take Fin. 33, Money and Banking. Students majoring in economics or finance will take Fin. 29, Money and Banking.

II. MAJOR PROGRAM (24 hours)

Before the end of the second semester of their sophomore year students will select a major or field of concentration. A major program will consist of twenty-four hours of sequential or related courses prescribed by the dean of the College and the head of the department concerned.

III. OPTIONAL COURSES (33 hours)

English or Foreign Language Option (12 hours)

Students who present two units in one foreign language for entrance credit will not be required to take further work in foreign languages. Students who present less than two units of a foreign language for entrance credit will be required to take six hours in one foreign language. Credit for less than six hours in an elementary language will not be accepted in partial satisfaction of this requirement.

Journ. 1-8, 14, 24, or other courses offered by the Department of English which may not require work in composition or a study of literature will not be accepted in satisfaction of the requirement in English or foreign language.

Other Arts Options (12 hours)

The Arts Options requirement may be met by taking a total of twelve hours work in the following fields, not more than six hours to be in any one of the fields designated: astronomy, education, fine arts, government, history, international relations, music, philosophy, psychology, religion, sociology.

Science Option (9 hours)

Not more than six hours in the Science Option may be taken in one department. The following courses are acceptable in satisfaction of the science requirement: Biol. 1, 6, 13, or 33 and 34; Geol. 1, or 3 and 4; Chem. 15 and 16; Phys. 12 and 16.

IV. ELECTIVES (12 hours)

Any courses in the University for which a student has the prerequisites may be used to meet this requirement.

COURSES OF STUDY

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Eco. 1	Ind. Evolution	3	Eco. 50	Economic Geography	3
	*English	3		*English	3
Math. 1b	Gen. Math. for Bus.	3	Math. 40	Math. of Finance	3
	Foreign Language or Arts Option	3		Foreign Language or Arts Option	3
	Science	3		Science	3
Mil. 1	Military Science	2	Mil. 2	Military Science	2
P.E. 1	Physical Education	—	P.E. 2	Physical Education	—
		17			17

FIRST SEMESTER — SOPHOMORE YEAR — SECOND SEMESTER

Acctg. 1	Accounting	3	Acctg. 2	Accounting	3
Eco. 3	Economics	3	Eco. 4	Economics	3
	Engl. or For. Lang. & Arts Options	6		Engl. or For. Lang. & Arts Options	9
	Science	3			
Mil. 3	Military Science	2	Mil. 4	Military Science	2
P.E. 3	Physical Education	—	P.E. 4	Physical Education	—
		17			17

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*For a statement of the freshman English requirement see "Freshman Composition" under the heading "English" in the section "Description of Courses."

Major in Accounting

JUNIOR AND SENIOR YEARS

Required Courses

FIRST SEMESTER				SECOND SEMESTER			
E.S.	145	Statistical Method..	3	E.S.	146	Business Cycles....	3
Eco.	11	Marketing	3	Eco.	133	Labor Problems....	3
Fin.	33	Money & Banking..	3	Fin.	25	Corporation Finance	3
Law	1	Business Law......	3	Law	2	Business Law......	3
Acctg.	113	Intermed. Acctg....	3	Acctg.	114	Intermed. Acctg....	3
Acctg.	115	Cost Acctg.........	3	Acctg.	118	Adv. Cost Acctg....	3
Acctg.	119	Sp. Acctg. Systems.	3	Acctg.	120	Auditing	3
Law	103	Fed. Tax Law.....	3			English .... or Arts Option..	3

Suggested Electives

I.E.	2	Industrial Mngmt...	3	I.E.	3	Industrial Mngmt...	3
Fin.	123	Investments	3	Eco.	106	Inter. Eco. Theory.	3

Major in Economics

JUNIOR AND SENIOR YEARS

Required Courses

FIRST SEMESTER				SECOND SEMESTER			
E.S.	145	Statistical Method..	3	E.S.	146	Business Cycles....	3
Eco.	11	Marketing	3	Fin.	25	Corporation Finance	3
Eco.	133	Labor Problems....	3	Eco.	134	Labor Problems....	3
Fin.	29	Money & Banking..	3	Fin.	30	Money & Banking..	3
Law	1	Business Law......	3	Eco.	106	Int. Eco. Theory...	3
Eco.	107	Adv. Economics....	3			English .... or Arts Option..	3
Fin.	127	Public Finance.....	3				

and nine semester hours to be selected from the following in consultation with the adviser:

E.S.	147	Nat. Income Anal..	3	E.S.	148	Adv. Bus. Cycles...	3
Eco.	135	Transportation	3	Eco.	108	Adv. Economics....	3
Fin.	41	Inter. Trade & Fin.	3	Fin.	128	Fiscal Policy.......	3
Eco.	171	Readings in Eco....	3	Eco.	136	Public Utilities.....	3
				Fin.	42	Int. Trade & Fin...	3
				Eco.	172	Readings in Eco....	3

Suggested Electives

Acctg.	113	Intermed. Acctg....	3	Phil.	14	Logic & Sci. Meth..	3
Math.	11	Alg. & Anal. Geom.	3	Math.	12	Anal. Geom. & Cal..	3
Hist.	127	Dev. Amer. Inst....	3	Hist.	128	Dev. Amer. Inst....	3
Hist.	131	Intel. Expan. Eur..	3	Hist.	132	Intel. Expan. Eur..	3

Major in Economic Statistics

JUNIOR AND SENIOR YEARS

Required Courses

FIRST SEMESTER				SECOND SEMESTER			
E.S.	145	Statistical Method..	3	E.S.	146	Business Cycles....	3
Eco.	11	Marketing	3	Eco.	133	Labor Problems....	3
*Fin.	29	Money & Banking..	3	*Fin.	30	Money & Banking..	3
Law	1	Business Law......	3	Fin.	25	Corporation Finance	3
E.S.	147	Nat. Income Anal..	3	E.S.	148	Adv. Bus. Cycles...	3
		English .... or Arts Option..	3	E.S.	152	Adv. Statis. Meth...	3
				Eco.	106	Int. Eco. Theory...	3

and twelve semester hours to be selected from the following in consultation with the adviser:

Fin.	123	Investments	3	Fin.	124	Investments	3
Fin.	127	Public Finance.....	3	Fin.	128	Fiscal Policy.......	3
Eco.	171	Readings in Eco....	3	Fin.	132	Mon. & Cr. Pol....	3
Math.	43	Math. of Life Ins...	3	Eco.	114	Sell. & Sales Mgmt.	3
I.E.	13	Chem. Ind. Engrg..	3	I.E.	14	Ind. Admin.	3
I.E.	125	Production Control.	3	I.E.	126	Quality Control....	3
Math.	13	Calculus	3	Math.	14	Inter. Calculus.....	3
Math.	123	Probability	3	Math.	124	Theo. of Errors....	3

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* Students whose primary interest is actuarial analysis will take Fin. 33 instead of Fin. 29 and Fin. 30.

Suggested Electives

Math.	11	Alg. & Anal. Geom.	3	Math.	12	Anal. Geom. & Cal..	3
Hist.	127	Dev. Amer. Inst....	3	Hist.	128	Dev. Amer. Inst....	3
E.S.	171	Read. in Eco. Stat..	3	E.S.	172	Read. in Eco. Stat..	3
				Math.	140	Higher Algebra....	3

Major in Finance

FIRST SEMESTER — JUNIOR AND SENIOR YEARS — SECOND SEMESTER

Required Courses

Fin.	29	Money & Banking..	3	Fin.	30	Money & Banking..	3
Fin.	25	Corp. Finance......	3	Fin.	26	Corp. Finance......	3
Fin.	123	Investments	3	Eco.	106	Int. Eco. Theory...	3
Fin.	127	Public Finance.....	3	Eco.	133	Labor Problems....	3
E.S.	145	Statistical Method..	3	E.S.	146	Business Cycles....	3
Law	1	Business Law......	3			English .... or Arts Option..	3
Eco.	11	Marketing	3				

and nine semester hours to be selected from the following in consultation with the adviser:

Fin.	131	Bank Credit Probs..	3	Fin.	42	Int. Trade & Fin...	3
Fin.	41	Int. Trade & Fin...	3	Fin.	124	Investments	3
E.S.	147	Nat. Income Anal..	3	Fin.	128	Fiscal Policy.......	3
				Fin.	132	Mon. & Cr. Policies	3
				E.S.	148	Adv. Bus. Cycles...	3

Suggested Electives

Acctg.	113	Intermed. Acctg....	3	Acctg.	114	Intermed. Acctg....	3
Eco.	107	Adv. Economics....	3	Eco.	108	Adv. Economics....	3
Fin.	171	Readings in Fin....	3	Fin.	172	Readings in Fin....	3

Major in Marketing

FIRST SEMESTER — JUNIOR AND SENIOR YEARS — SECOND SEMESTER

Required Courses

E.S.	145	Statistical Method..	3	E.S.	146	Business Cycles....	3
Eco.	11	Marketing	3	Eco.	133	Labor Problems....	3
Fin.	33	Money & Banking..	3	Fin.	25	Corp. Finance......	3
Law	1	Business Law......	3	Eco.	114	Sales & Sales Mgmt.	3
Eco.	113	Advertising	3	Eco.	106	Int. Eco. Theory...	3
Fin.	41	Int. Trade & Fin...	3			English .... or Arts Option..	3
Eco.	135	Transportation	3				
Eco.	15	Retailing	3				

and six semester hours to be selected from the following in consultation with the adviser:

E.S.	147	Nat. Income Anal..	3	Eco.	60	Insurance	3
Acctg.	115	Cost Acctg.........	3	Fin.	42	Int. Trade & Fin...	3
I.E.	2	Industrial Mngmt...	3	I.E.	3	Readings in Eco....	3
Soc.	161	Sociology	3	Psych.	16	Industrial Mngmt...	3
Eco.	171	Readings in Eco....	3	Eco.	172	Readings in Eco....	3

Suggested Electives

Engl.	41	Business Letters...	3	Speech	31	Bus. Speaking......	3
Journ.	43	Writing for Bus....	3				

Five Year Program in Business Administration and Industrial Engineering

Students who desire to pursue both business administration and industrial engineering may complete the required courses in both curricula in five years. The work required for the degree of Bachelor of Science in Business Administration may be completed by the end of the fourth year, and that required for the degree of Bachelor of Science in Industrial Engineering by the end of the fifth year; or the B.S. in I.E. may be obtained by the end of the fourth year, and the B.S. in Bus. Adm. by the end of the fifth year. It is necessary that a student be enrolled in the curriculum in which the degree is to be awarded. Students who wish to receive a degree in business administration by the end of the fourth year and one in industrial engineering by the end of the fifth year should plan their work with the director of the curriculum in business administration at the time they enter.

The College of Engineering

THE COLLEGE OF ENGINEERING

Administrative Officers

Martin Dewey Whitaker, *President*

Earl Kenneth Smiley, *Vice-President*

Harvey Alexander Neville, *Chairman of the Executive Committee*

Wray Hollowell Congdon, *Dean of Students and Director of Admissions*

John Douglas Leith, *Associate Dean of Students*

George Bartlett Curtis, *Registrar*

Faculty

Edward Delbert Amstutz	*Chemistry and Chemical Engineering*
Harold Victor Anderson	*Chemistry and Chemical Engineering*
Robert Edward Ashley	*Civil Engineering*
Paul Franklin Bartunek	*Physics*
Paul Leverne Bayley	*Physics*
James Mercer Beauchamp	*Mechanical and Industrial Engineering*
Jacob Lynford Beaver	*Electrical Engineering*
Walter Beck	*Metallurgical Engineering*
Lynn Simpson Beedle	*Civil Engineering*
Ferdinand Pierre Beer	*Civil Engineering*
Loyal Vivian Bewley	*Electrical Engineering*
Robert Dominick Billinger	*Chemistry and Chemical Engineering*
James Thomas Brown	*Civil Engineering*
Allison Butts	*Metallurgical Engineering*
Alfred Copeland Callen	*Mining Engineering*
Elliott Ward Cheney	*Physics*
Reuben Harvey Close	*Electrical Engineering*
Robert Elwood Crispen	*Civil Engineering*
Cassius Wild Curtis	*Physics*
Albert deNeufville	*Mechanics*
Alton Paige Dieffenbach	*Electrical Engineering*

Gilbert Everett Doan	*Metallurgical Engineering*
Willis Lyle Donaldson	*Electrical Engineering*
Nelson Roy Easton	*Chemistry and Chemical Engineering*
Raymond Jay Emrich	*Physics*
William Joseph Eney	*Civil Engineering*
Bela Kalman Erdoss	*Mechanical and Industrial Engineering*
Warren Walter Ewing	*Chemistry and Chemical Engineering*
Frederick P. Fay	*Mechanical Engineering*
Velmer Bernel Fish	*Chemistry and Chemical Engineering*
Frank Junior Fornoff	*Chemistry and Chemical Engineering*
Merton Otis Fuller	*Civil Engineering*
Robert Taylor Gallagher	*Mining Engineering*
Robert Charles Good, Jr.	*Physics*
Arthur Freeman Gould	*Mechanical and Industrial Engineering*
John Hammes Gross	*Metallurgical Engineering*
Howard Dietrich Gruber	*Electrical Engineering*
James Busse Hartman	*Mechanical and Industrial Engineering*
Peter Havas	*Physics*
Thomas Huger Hazlehurst	*Chemistry and Chemical Engineering*
Clarence Lester Hogan	*Physics*
Thomas Timings Holme	*Mechanical and Industrial Engineering*
James Mead Hyatt	*Physics*
Thomas Edgar Jackson	*Mechanical and Industrial Engineering*
Cyril Dewey Jensen	*Civil Engineering*
Bruce Gilbert Johnston	*Civil Engineering*
Paul Harry Kaar	*Civil Engineering*
John J. Karakash	*Electrical Engineering*
John Athan Karas	*Physics*
John Dale Kelly	*Mechanical and Industrial Engineering*
James Gilchrist Kerr	*Metallurgical Engineering*
Arthur Warner Klein	*Mechanical and Industrial Engineering*
Robert Baumgartner Kleinschmidt	*Civil Engineering*
Roger Edward Kolm	*Civil Engineering*
Alfred Baer Laponsky	*Physics*
Joseph Francis Libsch	*Metallurgical Engineering*
John Orth Liebig, Jr.	*Civil Engineering*
Alvin Conrad Loewer, Jr.	*Civil Engineering*
Darrel Eugene Mack	*Chemistry and Chemical Engineering*
Murray Burns McPherson	*Civil Engineering*
Archie Roscoe Miller	*Electrical Engineering*

Percival Ford Miller	*Civil Engineering*
Douglas Ewart Mode	*Electrical Engineering*
Edgar Kirton Muhlhausen	*Civil Engineering*
Frank Evans Myers	*Physics*
Russell Elwood Neal	*Civil Engineering*
Harvey Alexander Neville	*Chemistry and Chemical Engineering*
Harry Gordon Payrow	*Civil Engineering*
Einar Melvin Ramberg	*Mechanical and Industrial Engineering*
Roger Rawson	*Mechanical and Industrial Engineering*
Richard Noble Rhoda	*Chemistry and Chemical Engineering*
Donald George Sanders	*Civil Engineering*
Raymond Burkert Sawyer	*Physics*
Earl James Serfass	*Chemistry and Chemical Engineering*
George Clinton Shay	*Mechanical and Industrial Engineering*
Clarence Albert Shook	*Civil Engineering*
Charles Wellington Simmons	*Chemistry and Chemical Engineering*
Richard Thomas Smith	*Electrical Engineering*
Judson Gray Smull	*Chemistry and Chemical Engineering*
Wilbur DeVilla Bernhart Spatz	*Physics*
Robert Daniel Stout	*Metallurgical Engineering*
Milton Caleb Stuart	*Mechanical and Industrial Engineering*
Hale Sutherland	*Civil Engineering*
Kenneth Gilbert Swayne	*Civil Engineering*
Ronald James Sweeney	*Mechanical and Industrial Engineering*
Edwin Raymond Theis	*Chemistry and Chemical Engineering*
Vincent William Uhl	*Chemistry and Chemical Engineering*
Ambrose Randall West	*Civil Engineering*
William Hall Wetmore	*Mechanical and Industrial Engineering*
Donald Bingham Wheeler, Jr.	*Physics*
Robert Charles Whitehead, Jr.	*Mechanical and Industrial Engineering*
Albert Charles Zettlemoyer	*Chemistry and Chemical Engineering*

THE COLLEGE OF ENGINEERING

The College of Engineering offers curricula in chemical engineering, chemistry, civil engineering, electrical engineering, engineering physics, industrial engineering, mechanical engineering, metallurgical engineering, and mining engineering, and a combined course in the liberal arts and engineering.

The engineering curricula were formulated on the basis of an intense study, by the faculty of Lehigh University, of the problems of technical education and the changing needs of modern industry. This study led to the conclusion that greater emphasis than heretofore should be placed upon the fundamentals of engineering, including mathematics, physics, chemistry, and theoretical and applied mechanics, and less emphasis upon the highly specialized details of engineering practice; and that the engineer must know something of the social sciences, that is, the sciences which deal with human relations, and be familiar with the methods of business organization and administration. The various engineering curricula accordingly emphasize the fundamental sciences and those humanistic subjects which are a part of the equipment of every well educated man and which are now recognized as essential to the proper training of engineers because of their practical applications in industrial, business, and civic life.

Provision is made for a uniform freshman year in the College of Engineering; and the student's choice, at the time of entrance, of a specialized engineering curriculum may be changed, within the limitations of enrollment in the various curricula, prior to entering upon the sophomore year, without loss of time. It is hoped that after a year of college work and on the basis of conferences with members of the faculty, the student who is uncertain of his choice of a specialized engineering field may choose wisely.

The work of the first two years is fairly self-contained. To those who for one reason or another are unable to complete their engineering training, it affords preparation for careers as draftsmen, electricians, surveyors, shop foremen, or assistants in industrial laboratories or plants.

Near the close of the second year sophomores normally are required to take a general engineering aptitude test to determine their ability to apply to engineering problems the principles of chemistry, mathematics, and physics studied during the first two years. Students whose showing in this examination is unsatisfactory and whose work for the first two years has been poor may be compelled to withdraw from the College of Engineering.

Since the University recognizes that an engineer can not be trained by purely academic process, the degree awarded upon graduation is Bachelor of Science in the particular division of engineering that has been studied, for example, Bachelor of Science in Civil Engineering. The successful completion of one year of full-time graduate study leads to the degree of Master of Science. Professional degrees are conferred after five years of acceptable experience, as noted below.

General Study

The requirement of courses collectively designated "General Study" in the junior and senior years of the several curricula in engineering has as its purpose the extension of the sequence in the humanistic-social field represented in the freshman year by the course "Development of Western Civilization" and in the sophomore year by the course in economics. These first courses are designed to develop a broad knowledge of the political, social, and economic background which is our heritage, and to prepare the student for an intelligent approach to problems in these fields.

The objective of the humanistic-social stem in technical schools has been stated by the American Society for Engineering Education to be "Understanding of the evolution of the social organism within which we live. . . . Development of moral, ethical, and social concepts essential to a satisfying personal philosophy, to a career consistent with the public welfare, and to a sound professional attitude." We conceive it to be the duty of the engineer to be a professional man in the broadest sense of the term, a member of a group whose primary aim is to advance human wellbeing.

The courses fulfilling the General Study objective will be found in the broad area denoted by social science and the humanities, and accordingly designed to lead to a helpful understanding of the problems of world civilization and to motivation to life as a responsible member of a democratic community. In meeting this requirement broad, general courses will be selected by the student, subject to the approval of his curriculum director, from the fields of history, economics, sociology, and government, wherein knowledge is essential to competence as a citizen; and of literature, philosophy, psychology, biology, fine arts, and music, which afford means for broadening the engineer's intellectual outlook.

The Uniform Freshman Year

An outline follows of the work of the freshman year, uniform for all engineering students. For schedules of the work of the upper three years, varying according to the several specialized curricula, see the subsequent pages.

FRESHMAN YEAR

FIRST SEMESTER			SECOND SEMESTER		
Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Chem. 4	Gen. Chemistry....	4	Chem. 5	Gen. Chemistry....	4
*Engl. 1	Composition & Lit..	3	*Engl. 2	Composition & Lit..	3
Hist. 11	Dev. W. Civilization	3	Hist. 12	Dev. W. Civilization	3
†Math. 11	Alg. & Anal. Geom.	3	Math. 12	Anal. Geom. & Cal..	3
Phys. 22	Mech. & Prop. of Matter	4	C.E. 3	Eng. Draw........	3
C.E. 3	or Engr. Draw...	3	Phys. 22	or Mech. & Prop. of Matter	4
Mil. 1	Military Science....	2	Mil. 2	Military Science....	2
P.E. 1	Physical Education..	—	P.E. 2	Physical Education..	—
		18 or 19			18 or 19

Selection of Specialized Curricula

In the second semester of his freshman year each engineering student must select a particular engineering curriculum. This choice must be made at least one month before the end of the semester named.

Inspection Trips

Inspection trips to industrial plants are a required part of specific courses in the various curricula in engineering. Written reports or examinations are required. These trips are under the general direction and supervision of the faculty committee on inspection trips. They are generally held during the senior year and involve an average expense of about $25.00. The location of the University in the center of industrial activities of various types furnishes unusual opportunities for visits of inspection to engineering plants.

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*Engl. 1 and 2, Composition and Literature, are the courses normally taken in the first and second semesters respectively of the freshman year. Students who demonstrate superior ability in composition on the English placement tests are assigned to Engl. 3a and 3b, Types of World Literature. Those whose performance is regarded as unsatisfactory are required to complete successfully Engl. 0, Elementary Composition, followed by Engl. 1 and 2.

†Students who offer advanced algebra but not solid geometry for admission take Math. 11a, Solid Geometry and Analytic Geometry.

Combined Arts and Engineering Curricula

Students who can afford the extra time and money are urged to spend five years in their collegiate training and to cover the requirements for the B.A. degree as well as those for the B.S. in one of the branches of engineering.

Under the five-year plan the student registers in the College of Arts and Science for four years, earning the B.A. degree on completion of a program which includes, along with specific B.A. training, the fundamental mathematical, scientific, and engineering subjects of the engineering curriculum of his choice. The fifth year is spent in the College of Engineering, carrying on a program leading to the degree of B.S. in his selected branch of engineering. This is usually the senior year curriculum of the chosen branch of engineering.

An engineering student who decides at any stage of his course that he wishes to work for both the B.A. and B.S. degrees, may register in one of the colleges concerned for a period of years and complete the combined requirements of both degrees in five or six years, depending upon the program followed before the decision is made. His curriculum is so arranged that the work for one degree may be finished at the end of a four-year period, and the work for the subsequent degree at the close of the fifth or sixth year.

Professional Engineering Degrees

Graduates of the various technical curricula of Lehigh University with the degree of Bachelor of Science in Civil Engineering, Mechanical Engineering, Electrical Engineering, Metallurgical Engineering, Mining Engineering, Chemical Engineering, and Industrial Engineering, may be candidates for the corresponding professional degrees, namely, Civil Engineer (C.E.), Mechanical Engineer (M.E.), Electrical Engineer (E.E.), Metallurgical Engineer (Met.E.), Engineer of Mines (E.M.), Chemical Engineer (Ch.E.), and Industrial Engineer (I.E.). To qualify for a professional degree, a candidate must submit evidence of having had, since graduation, at least five years of acceptable experience in the field of engineering corresponding to the degree desired, and must submit also an acceptable thesis, the subject of which must be approved in advance by the department concerned. In exceptional cases, publications of a high order of merit may be accepted in lieu of a formal thesis. Should the degree applied for not correspond in subject matter to the candidate's undergraduate training, evidence must be furnished that any scholastic deficiency has been satisfied.

Graduates of Lehigh University with the degree of Master of Science in one of the engineering fields may be candidates for the appropriate professional degrees on the same basis as holders of a baccalaureate degree. A candidate who has had a year of acceptable graduate work at Lehigh or elsewhere may count the graduate year toward the partial satisfaction of the requirement of five years of acceptable experience.

Declaration of candidacy for professional degrees must be made on or before January 1 of the year in which the candidate expects to receive his degree. Application blanks may be obtained from the registrar. The thesis must be submitted in duplicate (one copy for the department and one for the University Library) on or before March 15 and should be sent directly to the department concerned. Formal application for a professional degree, accompanied by the required fee, must be made before May 15 of the year in which the degree is to be conferred. The fee for such a degree is $50.00. Professional degrees are conferred only in June.

THE CURRICULUM IN CHEMICAL ENGINEERING

The curriculum in chemical engineering is designed to prepare the student for the profession of chemical engineer, which includes the design, construction, operation, and management of manufacturing establishments in which chemical products are made. Such materials include paper, gasoline and other petroleum products, cement, coke, gas, dyes, electrochemical products, paint, rubber, leather, foods, and other substances. In addition to the primary requirement of chemistry in all its branches, the training of the chemical engineer includes a thorough knowledge of physics and mathematics, and a sound understanding of such fundamentals of chemical, mechanical, and electrical engineering as will make him a competent development, operating, or sales engineer.

After chemical investigations furnish a better understanding of known processes or develop novel processes or novel methods, it is the particular province of chemical engineering to carry them forward into industrial production. The curriculum is not planned to turn out a specialist restricted to any one type of product; the aim is rather to develop expertness in the sciences and fundamental unit manufacturing processes which underlie all chemical engineering. Some familiarity with factory methods under actual working conditions is acquired through contact with operations in nearby plants. Frequent visits for observation and report are made to manufacturing plants in the immediate neighborhood and in the Philadelphia and New York districts.

The graduate of this curriculum is prepared to accept with confidence a position in an industrial laboratory or plant, or to undertake further study at the graduate level leading to an advanced degree in either chemistry or chemical engineering.

THE CURRICULUM IN CHEMICAL ENGINEERING

FRESHMAN YEAR

FIRST SEMESTER — SECOND SEMESTER

See page 95.

SOPHOMORE YEAR

FIRST SEMESTER				SECOND SEMESTER			
Chem.	33	Analytical Chem...	3	Chem.	34	Analytical Chem...	3
Chem.	43	Anal. Chem. Conf...	1	Chem.	44	Anal. Chem. Conf...	1
Eco.	3	Economics	3	Eco.	4	Economics	3
Math.	13	Calculus	3	Math.	14	inter. Calculus.....	3
Phys.	24	Elec. & Magnetism..	4	Phys.	23	Heat, Sound & Lt...	4
Mech.	3	Statics & Dynamics	3	Met.	21	Engr. Metallurgy...	2
Mil.	3	Military Science....	2	Met.	81	Met. Problems.....	1
P.E.	3	Physical Education..	—	Mil.	4	Military Science...	2
				P.E.	4	Physical Education..	—
			19				19

JUNIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
Ch.E.	70	Ind. Stoichiometry..	3	Ch.E.	79	Chemical Engr.....	3
Ch.E.	78	Chemical Engr.....	3	Chem.	190	Physical Chemistry.	3
Chem.	91	Physical Chemistry.	3	Chem.	192	Phys. Chem. Lab...	1
Chem.	92	Phys. Chem. Lab...	1	Chem.	151	Organic Chemistry..	3
Chem.	150	Organic Chemistry..	3	Chem.	167	Org. Chem. Lab....	2
Chem.	165	Org. Chem. Lab....	2	M.E.	29	Heat Power........	3
		English Elective....	3			*General Study.....	3
P.E.	5	Physical Education..	—	P.E.	6	Physical Education..	—
			18				18

SUMMER

Eight weeks industrial employment with report.

SENIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
Ch.E.	180	Chemical Engr.....	3	Ch.E.	181	Chemical Engr.....	3
Chem.	194	Phys. & El'trochem.	3	Ch.E.	185	Ch. Engr. Practice.	1
Chem.	197	Electrochem. Lab...	1	Ch.E.	186	Ch.E. Thermo......	2
E.E.	60	Elec. Cir. & Appar..	3	Chem.	179	Hist. & Lit. Chem..	1
E.E.	61	Elec. Problems.....	1	Chem.	99	Research Lab......	2
E.E.	62	Dynamo Lab.......	1	Mech.	11	Mech. of Materials.	3
		*General Study....	6	M.E.	19	Mech. Engrg. Lab..	1
P.E.	7	Physical Education..	—	Chem.	102	Inorg. Chem...	3
				Chem.	158	or Ad. Org. Ch..	
				Chem.	171	or Ind. Biochem.	
				Ch.E.	183	or Unit Proc....	
				P.E.	8	Physical Education..	—
			18				16

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*For an elucidation of this requirement see page 94.

THE CURRICULUM IN CHEMISTRY

Chemists constitute nearly one-half of all professional research personnel in industry as shown by the 1940 report of the National Resources Planning Board. The American Chemical Society, which requires professional training and experience for eligibility, has a present membership of about 50,000. The consistently rapid increase in the membership of this society in recent years may be taken as an index of the expanding opportunities in the chemical profession.

The curriculum in chemistry provides a thorough grounding in the fundamentals of this science, with the requisite collateral training in physics and mathematics, and gives some consideration to industrial and engineering principles. In addition to the liberal allotment of time to courses in English, German, economics, history and other non-professional studies, provision is made for twelve semester hours (ordinarily four courses) of professional electives in a minor field of concentration to permit preparation for several types of careers in chemistry. The tabulation below indicates some of the possibilities of this guided selection of elective courses.

PREPARATION FOR	ELECTIVE SEQUENCE IN
Executive or sales departments of chemical industry	Business administration
Plant operation	Chemical engineering
Food and pharmaceutical industries	Biochemistry and bacteriology
Graduate study or research in physical chemistry	Physics and mathematics
Teaching, especially in public schools	Education
Metals industries	Metallurgy

Since the freshman year of this curriculum is identical with that of chemical engineering, and the sophomore years in the two curricula are nearly the same, it is possible for the student to transfer from one curriculum to the other before the beginning of the junior year without a considerable sacrifice of credits. In a transfer from chemical engineering to chemistry, the extra courses may be utilized as electives.

Seniors in the curriculum in chemistry may arrange to make the supervised visits to industrial plants which are required in the curriculum in chemical engineering.

THE CURRICULUM IN CHEMISTRY

FRESHMAN YEAR

FIRST SEMESTER — SECOND SEMESTER

See page 95.

SOPHOMORE YEAR

FIRST SEMESTER			SECOND SEMESTER		
Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Chem. 33	Analytical Chem...	3	Chem. 34	Analytical Chem...	3
Chem. 43	Anal. Chem. Conf...	1	Chem. 44	Anal. Chem. Conf...	1
Eco. 3	Economics	3	Eco. 4	Economics	3
†Ger. 1 or 3	German	3	†Ger. 2 or 4	German	3
Math. 13	Calculus	3	Math. 14	Inter. Calculus.....	3
Phys. 24	Elec. & Magnetism..	4	Phys. 23	Heat, Sound & Lt...	4
Mil. 3	Military Science....	2	Mil. 4	Military Science....	2
P.E. 3	Physical Education..	—	P.E. 4	Physical Education..	—
		19			19

JUNIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
Chem. 91	Physical Chemistry.	3	Chem. 151	Organic Chemistry.	3
Chem. 92	Phys. Chem. Lab...	1	Chem. 167	Org. Chem. Lab....	2
Chem. 150	Organic Chemistry..	3	Chem. 156	Quant. Org. Anal...	1
Chem. 165	Org. Chem. Lab....	2	Chem. 190	Physical Chem.....	3
†Ger. 7	Scientific German...	3	Chem. 192	Phys. Chem. Lab...	1
	English Elective...	3	Ch.E. 80	Ind. Eng. Chem....	3
	Elective	3		English Elective...	3
P.E. 5	Physical Education..	—		Elective	3
			P.E. 6	Physical Education..	—
		18			19

SUMMER

Eight weeks industrial employment with report.

SENIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
Chem. 137	Adv. Analyt. Chem.	3	Chem. 97	Research Lab......	3
Chem. 157	Qual. Org. Anal...	3	Chem. 102	Inorganic Chem....	3
Chem. 194	Phys. & El'trochem.	3	Chem. 179	Hist. & Lit. Chem..	1
Chem. 197	Electrochem. Lab...	1	Chem. 158 Chem. 171	Adv. Org. Chem... or Ind. Biochem.	3
	*General Study....	3		*General Study....	3
	Elective	3		Elective	3
P.E. 7	Physical Education..	—	P.E. 8	Physical Education..	—
		16			16

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*For an elucidation of this requirement see page 94.

†Students in this curriculum are required to pass Ger. 7, Scientific German. Those who are able to omit one or both semesters of the courses prerequisite to Ger. 7 will elect other courses as substitutes.

THE CURRICULUM IN CIVIL ENGINEERING

The purpose of this curriculum is to give instruction in those general and scientific subjects which form the foundation of all engineering, and a special training in the field of civil engineering, which includes the planning and building of highways, airports, railroads, harbors, docks and terminals, bridges, buildings, subways, tunnels, water supply and purification plants, sewage systems and sewage disposal plants, water power developments and the making of surveys.

Increasingly the engineering design and control of public works is becoming the function of some governmental agency. A large percentage of civil engineers, accordingly, may expect to be associated with a unit of government, federal, state, county, or city.

The work of the first three years deals chiefly with the scientific and mathematical basis of engineering practice. In the fourth year the application of these basic principles is studied in structural, hydraulic, sanitary, and transportation engineering, the major divisions of the wide field of civil engineering. Opportunity is given, chiefly in the fourth year, for students whose major interest is in either sanitary or hydraulic engineering, to omit some of the courses in the General Option, where the major emphasis is in the field of structures, and to substitute specialized courses in the field of their interest. A program of studies, planned to suit individual needs, known as the Administrative Option, is available for those students who wish to prepare themselves for the superintendence of construction, the administration of public works, dealing in building material, general contracting, and other work requiring operational organization and economy of management. Selection of all options is made at the beginning of the junior year.

With the war there came a great increase in the insistence of engineers, through their professional societies, educational and technical alike, that the engineering student be trained as a professional man, rather than a technician, with a sound understanding of the obligation he owes to society. This training is provided by the humanistic-social core extending through the four years. The General Study electives in the junior and senior years are chosen by the student with the advice and approval of the curriculum director with the distinct objective of fitting the student to meet this professional obligation.

THE CURRICULUM IN CIVIL ENGINEERING

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

See page 95.

SUMMER

C.E. 6, Land and Topographic Surveying (4)

SOPHOMORE YEAR

FIRST SEMESTER			SECOND SEMESTER		
Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Eco. 3	Economics	3	C.E. 16	Highway Engrg.	3
Math. 13	Calculus	3	Eco. 4	Economics	3
Mech. 1	Statics	3	Math. 14	Inter. Calculus	3
Mil. 3	Military Science	2	Mech. 2	Dynamics	3
Phys. 23	Heat, Sound & Lt.	4	Mil. 4	Military Science	2
General & Hydraulics Options			Phys. 24	Elec. & Magnetism	4
C.E. 31a	Route Surveying.3	3 or 4	P.E. 4	Physical Education	—
Sanitary Option					
Chem. 33	Analyt. Chem....3				
Chem. 43	An. Chem. Conf. 1				
P.E. 3	Physical Education	—			
		18 or 19			18

JUNIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
C.E. 35	Adv. Surveying	3	C.E. 15	Stresses	4
E.E. 60	Elec. Cir. & Appar.	3	Geol. 6	Engr. Geology	4
E.E. 61	Elec. Problems	1	Mech. 21	Mech. of Fluids	3
E.E. 62	Dynamo Lab	1	Mech. 23	Hydraulics Lab	1
Mech. 11	Mech. of Materials	3		*General Study	3
Mech. 13	Mat. Testing Lab	1	General Option		
	*General Study	3	Mech. 12	Mech. of Mat....3	3
General & Sanitary Options			Hydraulics Option		
M.E. 29	Heat Power.....3	3	M.E. 29	Heat Power.....3	
Hydraulics Option			Sanitary Option		
C.E. 136	Soil Mechanics...3		Biol. 50	Sanitary Bact....3	
P.E. 5	Physical Education	—	P.E. 6	Physical Education	—
		18			18

SUMMER

C.E. 29, Industrial Employment

SENIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
C.E. 118	Structural Theory	3	C.E. 101	Foundations	2
C.E. 119	Structural Design	3	C.E. 125	Reinf. Concr. Des.	3
C.E. 124	Structural Theory	3	C.E. 126	Concrete Lab	1
C.E. 128	Sanitary Engrg.	3	C.E. 129	San. Engrg. Des.	3
	*General Study	3	C.E. 130	San. Engrg. Lab	1
General Option				*General Study	3
C.E. 136	Soil Mechanics...3			Senior Conference	—
Hydraulics Option			General Option		
C.E. 141	Hydraul. Engr...3	3	C.E. 120	Structr. Des.....2	
Sanitary Option			C.E. 133	Transptn. Eng...3	
C.E. 136	Soil Mechanics...3		Hydraulics Option		
P.E. 7	Physical Education	—	C.E. 133a	Transptn. Eng. ..2	5
			C.E. 142	Hydr. Mach.....3	
			Sanitary Option		
			C.E. 131	Sanitary Engr...3	
			C.E. 133a	Transptn. Eng...2	
			P.E. 8	Physical Education	—
		18			18

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*For an elucidation of this requirement see page 94.

THE CURRICULUM IN ELECTRICAL ENGINEERING

The electrical engineer is one who practices the science and art of economically "directing the sources of electrical power in nature for the uses and conveniences of man." He may design, manufacture, install, or operate electrical machinery and equipment, manage plants and electric systems, or engage in the promotion of engineering projects.

The object of this curriculum is to give instruction in those general and scientific subjects which underlie all the branches of engineering, and to give special training in those technical and business subjects which experience shows are most essential in the equipment of the electrical engineer. In seeking to accomplish this object the department puts chief emphasis upon mastery of the mathematical-physical principles and thoroughness in the analysis of problems.

The curriculum provides a balanced allotment of time in each of four principal divisions: (1) mathematics and the basic sciences, (2) electrical engineering, (3) allied branches of engineering, and (4) non-technical subjects in arts and business. In order to make maximum use of the available time, the electrical courses are highly coordinated with respect to classroom and laboratory work; concurrent courses are designed to augment and supplement each other; and consecutive courses to extend and build upon the previous courses.

In recognition of different talents and inclinations among individuals, and of specialization in industry, three separate options are offered in the senior year: (1) the Power Option for those interested in the technical aspects of design, operation, and development of electrical machinery and power systems; (2) the Communications Option for those interested in the technical aspects of wire or radio communication; and, (3) the General Option for those less interested in technical applications and more inclined toward commercial, managerial and executive assignments. The work of the first two and a half years and some of that in the senior year is identical for each option; so that all graduates will have had the same basic work. Thus, although a student elects a particular option, he has a foundation sufficiently fundamental to enable him to enter any branch of electrical engineering.

THE CURRICULUM IN ELECTRICAL ENGINEERING

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

See page 95.

SOPHOMORE YEAR

FIRST SEMESTER | SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Eco. 3	Economics	3	Eco. 4	Economics	3
Math. 13	Calculus	3	E.E. 32a	Dir. Cur. Machines.	3
Mech. 1	Statics	3	E.E. 33a	Direct Cur. Lab....	1
Met. 21	Engr. Metallurgy...	2	Math. 14	Inter. Calculus.....	3
Met. 81	Met. Engr. Probs...	1	Mech. 2	Dynamics	3
Mil. 3	Military Science....	2	Mil. 4	Military Science....	2
Phys. 24	Elec. & Magnetism..	4	Phys. 23	Heat, Sound & Lt...	4
P.E. 3	Physical Education..	—	P.E. 4	Physical Education..	—
		18			19

JUNIOR YEAR

FIRST SEMESTER | SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
E.E. 34	Alt. Cur. Circuits..	3	E.E. 36	Alt. Cur. Machines.	3
E.E. 35	Alt. Cur. Cir. Lab..	1	E.E. 37a	A.C. Mach. Lab....	1
Math. 106	Adv. Calculus......	3	E.E. 40	Indust. Electronics.	3
Mech. 11	Mech. of Materials.	3	Mech. 21	Mech. of Fluids...	3
Mech. 13	Mat. Testing Lab...	1	Mech. 23	Hydraulics Lab....	1
M.E. 22	Thermodynamics ...	3	M.E. 23	Thermodynamics ...	3
Phys. 110	Adv. Elect. Lab....	1	Phys. 111	Adv. Elect. Lab....	1
	*General Study....	3		*General Study....	3
P.E. 5	Physical Education..	—	P.E. 6	Physical Education..	—
		18			18

SUMMER

E.E. 24, Industrial Employment

SENIOR YEAR

FIRST SEMESTER | SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
M.E. 21	Mech. Engrg. Lab..	1	E.E. 117	Proseminar	1
	*General Study....	3	M.E. 25	Mech. Engrg. Lab..	1
			Speech 30	Fund. of Speech...	3

POWER OPTION

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
E.E. 38	Alt. Cur. Mach.....	3	E.E. 132	Elec. Transients....	3
E.E. 39	A.C. Mach. Lab....	2	E.E. 134	Trans. Line Trans..	3
E.E. 131	Elec. & Mag. Fields	3	E.E. 136a	System Stability....	3
E.E. 133	Transmission Lines.	3	E.E. 137	Adv. Mach. Theory.	3
E.E. 135	Symmetrical Comp.	3	E.E. 138	Transients Lab.....	1

COMMUNICATIONS OPTION

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
E.E. 131	Elec. & Mag. Fields	3	E.E. 38	Alt. Cur. Mach.....	3
E.E. 141	Radio Commun.....	3	E.E. 39	A.C. Mach. Lab....	2
E.E. 143	Wire Commun.....	3	E.E. 132	Electric Transients.	3
E.E. 147	Electromag. Theory.	4	E.E. 142	Radio Commun.....	3
			E.E. 144	Wire Commun.....	3

GENERAL OPTION

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
E.E. 38	Alt. Cur. Mach.....	3	Acctg. 4	Accounting	3
E.E. 39	A.C. Mach. Lab....	2	E.E. 102	Distribution Syst...	3
E.E. 101	Elec. Pwr. Stations.	3	E.E. 105	Indus. Applications.	3
E.E. 103	Indus. Applications.	3	I.E. 3	Indus. Management or Business Elec.	3
I.E. 2	Indus. Management or Business Elec.	3	P.E. 8	Physical Education..	—
P.E. 7	Physical Education..	—			
		17 or 18			17, 18 or 19

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*For an elucidation of this requirement see page 94.

THE CURRICULUM IN ENGINEERING PHYSICS

The curriculum in engineering physics has been developed over a number of years to meet a demand on the part of industry and government for men trained in the fundamentals and techniques of scientific research.

Industrial expansion and development, and even the establishment of entirely new industries have repeatedly followed upon research. The widespread recognition of this fact in recent years has led to the organization of laboratories of research in nearly every industry, great and small, with a consequent demand for suitably trained men.

The amazing expansion in the electircal industries is almost wholly the result of organized research. This statement applies more or less to every major industry. The products of research include the incandescent lamp, the x-ray tube, telephone, radio, automobile, airplane, talking movies, optical glass, etc.

While the training in this curriculum is intended to be in fundamentals primarily, it is still consciously practical. While it is practical, it is not permitted to lose sight of the fact that today's theory may yield tomorrow's practice.

Graduates from this curriculum find places in government laboratories and in the laboratories of the electrical, communication, automotive, and other industries. Some students continue their studies in the academic field, pursuing research as members of the staff of a college or university.

The curriculum includes a liberal number of electives, wherein each student may develop his best talents by particular attention to topics of special interest. Such topics constitute a liaison with particular branches of technology, among which may be mentioned electro-acoustics, telephone engineering, geophysical practice, etc. Each student is urged to cultivate some such special interest but only to that moderate degree which still permits him to acquire a fully adequate comprehension of fundamentals.

THE CURRICULUM IN ENGINEERING PHYSICS

FIRST SEMESTER

FRESHMAN YEAR

SECOND SEMESTER

See page 95.

FIRST SEMESTER

SOPHOMORE YEAR

SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Chem. 91	Physical Chem.....	3	Eco. 4	Economics	3
Eco. 3	Economics	3	†Ger.	German 3	
†Ger.	German 3		or		3
or		3		Approved Elec...3	
	Approved Elec...3		Math. 14	Inter. Calculus.....	3
Math. 13	Calculus	3	Mech. 3	Statics & Dynamics	3
Phys. 24	Elec. & Magnetism..	4	Phys. 23	Heat, Sound & Lt...	4
Mil. 3	Military Science....	2	Mil. 4	Military Science....	2
P.E. 3	Physical Education..	—	P.E. 4	Physical Education..	—
		18			18

FIRST SEMESTER

JUNIOR YEAR

SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
E.E. 34	A.C. Circuits.....3		Mech. 101	Adv. Dynamics.....	3
E.E. 35	and A.C. Lab....1	4	Phys. 61	Lab. Techniques....	1
or		or	Phys. 111	Adv. Elect. Lab....	1
E.E. 60	El. Cir. & App...3	5	Phys. 126	Heat & Pyrometry.	4
E.E. 61	and El. Probs...1		Phys. 163	Theo. Elec. & Mag..	3
E.E. 62	and Dyn. Lab....1			*General Study....	3
Math. 106	Adv. Calculus......	3		Elective	3
Phys. 110	Adv. Elect. Lab....	1	P.E. 6	Physical Education..	—
Phys. 122	Optics	4			
Phys. 162	Theo. Elec. & Mag..	3			
	*General Study....	3			
P.E. 5	Physical Education..	—			
		18 or 19			18

SUMMER

Phys. 50, Industrial Employment

FIRST SEMESTER

SENIOR YEAR

SECOND SEMESTER

Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Phys. 124	El. Dis. thr. Gases.	4	Phys. 161	Modern Theories...	3
Phys. 160	Modern Theories...	3	Phys. 165	Advanced Lab.....	2
Phys. 164	Advanced Lab.....	2	Phys. 168	Proseminar	1
	*General Study....	3	Phys. 120	Elec. Waves.....4	
	Electives	6	or		3
P.E. 7	Physical Education..	—	Phys. 166	Spl. Topics......3	or
			or		4
			Phys. 170	Spectroscopy 3	
				*General Study....	3
				Electives	4-6
			P.E. 8	Physical Education..	—
		18			17 or 18

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*For an elucidation of this requirement see page 94.

†Students who have had no German in preparatory school will take Ger. 1 and 2, Elementary German. Those who offer two units of German for entrance will take Ger. 3, Intermediate German, and Ger. 7, Scientific German. Students whose previous training, formal or otherwise, in the language represents more than the equivalent of two years of preparatory school German will take, at the discretion of the curriculum director, three or six hours of work in other fields instead of German, the specific courses to be designated by the curriculum director.

THE CURRICULUM IN INDUSTRIAL ENGINEERING

Industrial engineering concerns itself with the management of industrial enterprises. Particular emphasis is given to the organization, operation, and control of manufacturing plants and to the development of sound personnel policies. It embraces the principles of scientific management, the basic engineering sciences, as well as the principles of economics, finance, and accounting and coordinates these various elements in the study of the many diverse problems encountered in the manufacturing and service industries.

The goal of industrial engineering is the improvement of the general standard of living as the result of increased worker productivity by the application of the prinicples of scientific management and the utilization of technical improvements when economically justifiable.

The material covered by the curriculum in industrial engineering includes, in addition to the basic and fundamental courses, work in production planning and control, job evaluation, work simplification, personnel relations, quality control, and product engineering.

There is a demand on the part of industry for men who have had not only a thorough training in the fundamentals of engineering, but also a knowledge of those problems in accounting, finance, statistics, and management which every enterprise encounters. The object of the curriculum in industrial engineering is to add a knowledge of the basic facts of economics, finance, and management to the technical knowledge and scientific spirit that come from the study of engineering.

The curriculum in industrial engineering is primarily an engineering curriculum supplemented by courses in economics and business administration. The curriculum is designed to meet the needs of those students who intend to enter industries essentially technical, whether public utilities or manufacturing plants, but who intend to go into the administrative departments.

THE CURRICULUM IN INDUSTRIAL ENGINEERING

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

See page 95.

SUMMER

M.E. 3, Machine Shop Practice (4)

SOPHOMORE YEAR

FIRST SEMESTER				SECOND SEMESTER			
Course No.		*Course Title*	*Cr. Hrs.*	*Course No.*		*Course Title*	*Cr. Hrs.*
Eco.	3	Economics	3	Eco.	4	Economics	3
I.E.	13	Elem. Ind. Engrg.	3	M.E.	22	Thermodynamics	3
Mech.	1	Statics	3	Mech.	2	Dynamics	3
Math.	13	Calculus	3	Math.	14	Inter. Calculus	3
Phys.	23	Heat, Sound & Lt.	4	Phys.	24	Elec. & Magnetism.	4
Mil.	3	Military Science	2	Mil.	4	Military Science	2
P.E.	3	Physical Education	—	P.E.	4	Physical Education	—
			18				18

JUNIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
Acttg.	4	Acctg. for Engrs.	3	Acctg.	6	Cost Ac. for Engrs.	3
Fin.	25	Corp. Finance	3	Mech.	11	Mech. of Materials.	3
M.E.	23	Thermodynamics	3	Met.	21	Engr. Metallurgy	2
Psych.	1	Elem. Psychology	3	Met.	81	Met. Problems	1
I.E.	14	Ind Administration.	3	Psych.	152	Ind. Sel. & Class.	3
		*General Study	3	I.E.	15	Personnel Admin.	3
P.E.	5	Physical Education	—			*General Study	3
				P.E.	6	Physical Education	—
			18				18

SUMMER

I.E. 1, Industrial Employment

SENIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
E.S.	145	Statistics	3	E.S.	146	Business Cycles	3
†I.E.		Adv. Ind. Engrg.	3	‡I.E.		Adv. Ind. Engrg.	3
M.E.	40	Machine Design	3	E.E.	60	Elec. Cir. & Appar.	3
Law	1	Business Law	3	E.E.	61	Elec. Problems	1
		*General Study	3	E.E.	62	Dynamo Lab.	1
		Approved Elective.	3			*General Study	3
P.E.	7	Physical Education	—			Approved Electives.	4
				P.E.	8	Physical Education	—
			18				18

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*For an elucidation of this requirement see page 94.

†I.E. 125, 127, 129

‡I.E. 126, 128, 130

THE CURRICULUM IN MECHANICAL ENGINEERING

Mechanical engineering deals with the design, construction, installation, and operation of machinery necessary for the economical and advantageous use of power, and with the management of industries and organizations manufacturing and using power-driven equipment. The high degree of technical skill and efficiency essential to the work of research, design, construction, and operation, which underlies mechanical engineering practice, necessarily prescribes a training based on the fundamental sciences of chemistry, physics, and mathematics.

Aptitude and skill in the interpretation and application of the basic technical sciences are, however, not sufficient. In addition the engineer must acquire an understanding of the influences of his profession on social institutions and traditions. To this end the curriculum requires the student to register for courses in the College of Arts and Science or the College of Business Administration or both, during each of the four years.

The curriculum is broad, and designed to meet the needs of young men interested in the scientific aspects of industry. Emphasis is placed on the fundamental principles underlying the numerous fields of mechanical engineering, including design, power, aeronautics, air-conditioning, and refrigeration. The young graduate ordinarily enters a graduate apprenticeship in a public utility, manufacturing, or operating organization where opportunity is provided for his development in research, design, operation, sales, or administration, depending upon his interests and aptitudes and the opportunities available.

THE CURRICULUM IN MECHANICAL ENGINEERING

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

See page 95.

SUMMER

M.E. 3, Machine Shop Practice (4)

FIRST SEMESTER — SOPHOMORE YEAR — SECOND SEMESTER

Course No.		Course Title	Cr. Hrs.	Course No.		Course Title	Cr. Hrs.
Eco.	3	Economics	3	Eco.	4	Economics	3
Math.	13	Calculus	3	I.E.	13	Elem. Ind. Engrg...	3
M.E.	39	Elem. Mach. Des...	3	Math.	14	Inter. Calculus.....	3
Mech.	1	Statics	3	Mech.	2	Dynamics	3
Phys.	23	Heat, Sound & Lt..	4	Phys.	24	Elec. & Magnetism..	4
Mil.	3	Military Science....	2	Mil.	4	Military Science....	2
P.E.	3	Physical Education.	—	P.E.	4	Physical Education..	—
			18				18

FIRST SEMESTER — JUNIOR YEAR — SECOND SEMESTER

Math.	106	Adv. Calculus......	3	M.E.	40	Machine Design ...	3
M.E.	22	Thermodynamics ...	3	M.E.	23	Thermodynamics ..	3
M.E.	10	Instruments Lab...	1	M.E.	11	Mech. Engrg. Lab..	1
Mech.	21	Mech. of Fluids...	3	E.E.	60	Elec. Cir. & Appar.	3
Mech.	23	Hydraulics Lab....	1	E.E.	61	Elec. Problems.....	1
Mech.	11	Mech. of Materials.	3	E.E.	62	Dynamo Lab.......	1
Mech.	13	Mat. Testing Lab...	1	Met.	21	Engr. Metallurgy...	2
		*General Study....	3	Met.	81	Met. Problems.....	1
P.E.	5	Physical Education..	—			*General Study....	3
				P.E.	6	Physical Education..	—
			18				18

SUMMER

I.E. 1, Industrial Employment

FIRST SEMESTER — SENIOR YEAR — SECOND SEMESTER

M.E.	14	Mech. Engrg. Lab..	2	Acctg.	4	Acctg. for Engrs...	3
M.E.	121	Adv. Mach. Des....	3	M.E.	18	I.C. Engine Lab....	2
†M.E.		Adv. Mech. Engrg..	3	†M.E.		Adv. Mech. Engrg..	3
Met.	33	Metallurgical Lab..	1	Met.	34	Metallurgical Lab..	1
		Approved Electives.	6			Approved Electives.	6
		*General Study....	3			*General Study....	3
P.E.	7	Physical Education.	—	P.E.	8	Physical Education.	—
			18				18

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*For an elucidation of this requirement see page 94.

†Advanced M.E. courses to be chosen, with the approval of the curriculum director, on the basis of the individual's interests and needs.

THE CURRICULUM IN METALLURGICAL ENGINEERING

Metallurgical engineering formerly signified the production and refining of metals for industrial and military use. More recently the applications of science to alloying, rolling and forging, heat treatment, machining, and welding, the later stages in the manufacturing processes, have widened the field. A sound general education, coupled with thorough grounding in basic science and general engineering, remain, however, the wisest preparation for the specialist in any of these fields.

Outside of the basic studies in science, general engineering, and metallurgy required of all for the degree, flexibility is provided in the curriculum to permit its adaptation to the individual abilities, prospects, and plans of the student by limited electives and professional subjects. Thus, in addition to acquiring a knowledge of the essential basic subjects, the student can develop in the direction of research with advanced courses in chemistry, physics, mathematics, German, and research; toward plant operation with electives such as labor problems, psychology, and industrial management; or toward the business side of metallurgy with courses such as advanced economics, sociology, and accounting—all without jeopardizing the soundness and adequacy of his basic engineering education.

Those wishing to prepare for electrometallurgy can do so by choosing as electives appropriate courses in the department of electrical engineering and substituting a course in electrometallurgy for an advanced course in the metallurgy of iron and steel.

THE CURRICULUM IN METALLURGICAL ENGINEERING

FIRST SEMESTER — FRESHMAN YEAR — SECOND SEMESTER

See page 95.

SOPHOMORE YEAR

FIRST SEMESTER			SECOND SEMESTER		
Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Chem. 37	Analytical Chem...	2	Eco. 4	Economics	3
Chem. 47	Anal. Chem. Conf...	1	Geol. 1	Prin. of Geology...	3
Eco. 3	Economics	3	Math. 14	Inter. Calculus.....	3
Math. 13	Calculus	3	Mech. 3	Statics & Dynamics	3
Met. 1	Intro. to Met......	3	Phys. 23	Heat, Sound & Lt...	4
Phys. 24	Elec. & Magnetism..	4	Mil. 4	Military Science....	2
Mil. 3	Military Science....	2	P.E. 4	Physical Education..	—
P.E. 3	Physical Education..	—			
		18			18

JUNIOR YEAR†

FIRST SEMESTER			SECOND SEMESTER		
Chem. 91	Phys. Chemistry...	3	Chem. 190	Phys. Chemistry...	3
Engl. 36	World Literature..	3	M.E. 29	Heat Power........	3
Geol. 35	Engrg. Mineralogy..	2	Met. 52	Met. of Iron & Stl..	3
Met. 125	Electrometallurgy .	2	Met. 62	Iron & Steel Prob..	1
Met. 130	Phys. Metallurgy..	3	Met. 131	Metallography	3
Met. 135	Electrochem Lab...	1		*General Study....	3
	*General Study....	3		Elective	3
P.E. 5	Physical Education..	—	P.E. 6	Physical Education..	—
		17			19

SUMMER

Met. 49, Summer Employment

SENIOR YEAR†

FIRST SEMESTER			SECOND SEMESTER		
E.E. 60	Elec. Cir. & Appar.	3	M.E. 19	Mech. Engrg. Lab..	1
E.E. 61	Elec. Problems.....	1	Met. 54	Met. of Zinc, etc...	2
E.E. 62	Dynamo Lab.......	1	Met. 138	Met. Colloquium....	2
Mech. 11	Mech. of Materials..	3	Met. 152	Adv. Met. of Ir.-St.	3
Mech. 13	Mat. Testing Lab...	1	Met. 164	Prob. in Zinc, etc..	1
Met. 53	Met. of Cop., Ld., etc.	3	Met. 175	Proj. in Met.....2 or Elective....2	2
Met. 163	Non-Ferrous Prob..	1			
Met. 175	El. Proj. in Met..2 or Elective....2	2		*General Study....	3
				Elective	3
	Elective	3	P.E. 8	Physical Education..	—
P.E. 7	Physical Education..	—			
		18			17

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*For an elucidation of this requirement see page 94.

†In optional preparation for electrometallurgy, Met. 108, E.E. 40 and E.E. 103 are required, being taken in the junior or senior year, while Met. 152 becomes optional. E.E. 60, 61, and 62 (prerequisites to E.E. 40 and 103) must be taken in the first or second semester of the junior year, with equivalent transfer of junior subjects to the senior year.

THE CURRICULUM IN MINING ENGINEERING

Mining engineering concerns itself with the search for, extraction from the ground, and the initial preparation of the minerals and rocks that are needed to meet the demands of our modern civilization. So basic is the mining industry, so dependent on it are all individuals and industries, that ours has been called a "mineral civilization." Three great classes of materials are provided by the mining engineer: mineral fuels, including coal, petroleum, and natural gas; ores of the metals; non-metallics, such as slate, limestone, gypsum, sand and gravel, and scores of others.

All the operations at the mine are within the responsibility of the mining engineer. The actual work of extraction may be only one of his activities, for he may also have to deal with exploration, plant construction, transportation, preparation and processing, and all phases of mine administration. Modern mining has become, in many cases, a mass-production industry. The mechanization of mines has gone forward with startling rapidity. Electrical applications are found in every phase of the industry. The need for engineering training was never more important.

The curriculum in mining engineering includes the basic sciences common to all branches of engineering—mathematics, physics, chemistry, and mechanics. During the last two years a thorough and progressive training is given in the principles of mining and the methods used in extraction. Special attention is directed to the mechanization of mine operations; to mine ventilation, transportation, economics and administration; and to coal preparation and ore dressing. Technical courses in civil, electrical and mechanical engineering form a part of this advanced work.

Electives in the senior year permit the student to take additional work in business administration or in geology, or he may choose the basic courses in geophysics. On the other hand, he may prefer added courses in other engineering departments.

For those students who have decided by the end of the sophomore year that they wish to specialize in geophysics, an option in engineering geophysics has been established. In this option courses in geophysics, advanced mathematics and physics, and in geology replace certain courses in engineering technology that are required in the regular mining curriculum.

THE CURRICULUM IN MINING ENGINEERING

FRESHMAN YEAR

FIRST SEMESTER — SECOND SEMESTER

See page 95.

SUMMER

C.E. 6a, Land and Topographic Surveying (3)

SOPHOMORE YEAR

FIRST SEMESTER			SECOND SEMESTER		
Course No.	*Course Title*	*Cr. Hrs.*	*Course No.*	*Course Title*	*Cr. Hrs.*
Chem. 37	Analytical Chem.	2	Eco. 4	Economics	3
Chem. 47	Anal. Chem. Conf.	1	Math. 14	Inter. Calculus	3
Eco. 3	Economics	3	Mech. 2	Dynamics	3
Math. 13	Calculus	3	Min. 6a	Mine Surveying	2
Mech. 1	Statics	3	Phys. 24	Elec. & Magnetism.	4
Phys. 23	Heat, Sound & Lt.	4	Mil. 4	Military Science	2
Mil. 3	Military Science	2	P.E. 4	Physical Education	—
P.E. 3	Physical Education	—			
		18			17

SUMMER

Min. 16, Mine Surveying (2)

JUNIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
Mech. 11	Mech. of Materials.	3	Acctg. 4	Acctg. for Engrs.	3
Mech. 13	Mat. Testing Lab.	1	Mech. 21	Mech. of Fluids.	3
Geol. 1	Prin. of Geology	3	Mech. 23	Hydraulics Lab.	1
Geol. 31	Mineralogy	3	Geol. 32	Petrology	3
Met. 21	Engr. Metallurgy	2	M.E. 29	Heat Power	3
Met. 81	Met. Problems	1	Min. 22	Mining Methods	3
Min. 21	Min. Fundamentals.	3		*General Study	3
	*General Study	3	P.E. 6	Physical Education	—
P.E. 5	Physical Education	—			
		19			19

SUMMER

Min. 20, Summer Employment

SENIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
E.E. 60	Elec. Cir. & Appar.	3	C.E. 30	Structural Design.	3
E.E. 61	Elec. Problems	1	Engl. 42	Technical Writing.	3
E.E. 62	Dynamo Lab.	1	Min. 104	Hoist., Haul., Pump	3
Min. 103	Mine Ventilation	3	Min. 105	Mine Administra.	2
Min. 106	Mining Economics.	3		Approved Electives.	6
Min. 107	Mineral Prep.	3	P.E. 8	Physical Education	—
	*General Study	3			
P.E. 7	Physical Education	—			
		17			17

OPTION IN ENGINEERING GEOPHYSICS

(The freshman and sophomore years are the same as the regular curriculum in mining engineering.)

JUNIOR YEAR

FIRST SEMESTER			SECOND SEMESTER		
Eng.Geop.101	Geophysical Meth.	3	Eng.Geop.102	Geophysical App.	3
Geol. 1	Prin. of Geology	3	Geol. 12	Historical Geol.	3
Geol. 31	Mineralogy	3	Geol. 32	Petrology	3
Math. 106	Adv. Calculus	3	Mech. 11	Mech. of Materials.	3
Min. 21	Min. Fundamentals.	3	Mech. 13	Mat. Testing Lab.	1
Phys. 162	Theo. Elec. & Mag.	3	Min. 22	Mining Methods	3
P.E. 5	Physical Education	—	Phys. 163	Elec. & Magnetism.	3
			P.E. 6	Physical Education	—
		18			19

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*For an elucidation of this requirement see page 94.

SUMMER

Min. 20, Summer Employment

SENIOR YEAR

FIRST SEMESTER				SECOND SEMESTER			
E.E.	40	Indust. Electronics.	3	Eng.Geop.	104	El. & Grav. Prosp..	3
Eng.Geop.	103	Seismic & Mag. Pr..	3	Engl.	42	Technical Writing..	3
Geol.	121	Structural Geol.....	3	Geol.	112	Stratigraphy	3
Min.	106	Mining Economics..	3	Mech.	21	Mech. of Fluids....	3
Phys.	124	Elec. Disch. thru Gases	4	Min.	105	Mine Administra...	2
		*General Study....	3			*General Study....	3
P.E.	7	Physical Education..	—	P.E.	8	Physical Education..	—
			19				17

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*For an elucidation of this requirement see page 94.

The Graduate School

THE GRADUATE SCHOOL

Administrative Officers

Martin Dewey Whitaker, *President*

Earl Kenneth Smiley, *Vice-President*

Robert Pattison More, *Executive Secretary of the Graduate Faculty*

Wray Hollowell Congdon, *Director of Admissions*

George Bartlett Curtis, *Registrar*

Faculty

William Appleton Aiken	*History*
Carl Elmer Allen	*Accounting*
Edward Delbert Amstutz	*Chemistry and Chemical Engineering*
Harold Victor Anderson	*Chemistry and Chemical Engineering*
Allen Jennings Barthold	*Romance Languages*
Arthur Crocker Bates	*Mechanical Engineering*
Paul Leverne Bayley	*Physics*
Jacob Lynford Beaver	*Electrical Engineering*
Lewis White Beck	*Philosophy*
Walter Beck	*Metallurgical Engineering*
Frank Chester Becker	*Philosophy*
Ferdinand Pierre Beer	*Mechanics*
Loyal Vivian Bewley	*Electrical Engineering*
Robert Dominick Billinger	*Chemistry and Chemical Engineering*
Frederick Alden Bradford	*Finance*
Elmer Clark Bratt	*Economic Statistics*
Robert Allen Bream	*Education*
Allison Butts	*Metallurgical Engineering*
Alfred Copeland Callen	*Mining Engineering*
*Neil Carothers	*Economics and Sociology*

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*On leave 1948-1949

Elliott Ward Cheney	*Physics*
Glenn James Christensen	*English*
Wray Hollowell Congdon	*Education*
Roy Burford Cowin	*Accounting*
Earl LeVerne Crum	*Greek*
Cassius Wild Curtis	*Physics*
Edward Hutchins Cutler	*Mathematics*
Harry Barrett Davis	*English and Speech*
Herbert Maynard Diamond	*Economics and Sociology*
Gilbert Everett Doan	*Metallurgical Engineering*
William Joseph Eney	*Civil Engineering*
Bela Kalman Erdoss	*Mechanical and Industrial Engineering*
S. Blaine Ewing	*English*
Warren Walter Ewing	*Chemistry and Chemical Engineering*
Adelbert Ford	*Psychology*
Frank Junior Fornoff	*Chemistry*
Merton Otis Fuller	*Civil Engineering*
Robert Taylor Gallagher	*Mining Engineering*
Hugh Richard Gault	*Geology*
Lawrence Henry Gipson	*History*
Wilson Leon Godshall	*International Relations*
James Larmour Graham	*Psychology*
George Dewey Harmon	*History*
James Busse Hartman	*Mechanical Engineering*
Thomas Huger Hazlehurst	*Chemistry and Chemical Engineering*
Thomas Timings Holme	*Mechanical and Industrial Engineering*
Hervey Devolzo Hotchkiss	*Finance*
James Mead Hyatt	*Physics*
Thomas Edgar Jackson	*Mechanical Engineering*
John Edward Jacobi	*Sociology*
William Leroy Jenkins	*Psychology*
Cyril Dewey Jensen	*Civil Engineering*
Finn Bjorn Jensen	*Economics*
Bruce Gilbert Johnston	*Civil Engineering*
Arthur Warner Klein	*Mechanical Engineering*
Kenneth Worcester Lamson	*Mathematics*
Voris V. Latshaw	*Mathematics*
Darrel Eugene Mack	*Chemistry and Chemical Engineering*
Archie Roscoe Miller	*Electrical Engineering*
Douglas Ewart Mode	*Electrical Engineering*

Robert Pattison More	*German*
Frank Evans Myers	*Physics*
Harvey Alexander Neville	*Chemistry and Chemical Engineering*
Bradford Breckenridge Owen	*Biology*
Philip Mason Palmer	*German*
Basil Waldo Parker	*Biology*
Harry Gordon Payrow	*Civil Engineering*
Arthur Everett Pitcher	*Mathematics*
Maurice John Quinlan	*English*
George Emil Raynor	*Mathematics*
Edgar Heisler Riley	*English*
Raymond Burkert Sawyer	*Physics*
Ernst Bernhard Schulz	*Government*
Earl James Serfass	*Chemistry and Chemical Engineering*
Jonathan Burke Severs	*English*
Clarence Albert Shook	*Mathematics*
Charles Wellington Simmons	*Chemistry and Chemical Engineering*
Lloyd Leroy Smail	*Mathematics*
Robert Metcalf Smith	*English*
Judson Gray Smull	*Chemistry and Chemical Engineering*
Rafael Arcangel Soto	*Romance Languages*
Robert Roth Stoll	*Mathematics*
Robert Daniel Stout	*Metallurgical Engineering*
Carl Ferdinand Strauch	*English*
Milton Caleb Stuart	*Mechanical Engineering*
Hale Sutherland	*Civil Engineering*
Edwin Raymond Theis	*Chemistry and Chemical Engineering*
Harold Prescott Thomas	*Education*
Stanley Judson Thomas	*Biology*
Francis John Trembley	*Biology*
Lawrence Whitcomb	*Geology*
Bradford Willard	*Geology*
Horace Wetherill Wright	*Latin*
Albert Charles Zettlemoyer	*Chemistry and Chemical Engineering*

Executive Committee of the Graduate Faculty

Professor More, *Chairman,* President Whitaker, and Vice-President Smiley (*ex officiis*), Professors Beaver, Butts, Harmon, Johnston, and Myers.

THE GRADUATE SCHOOL

Opportunity for graduate study was contemplated at Lehigh from its beginning and was announced in its first Register in 1866. More definite organization of the work along lines that are now generally accepted dates from 1883. Since that time the degrees of Master of Arts and Master of Science have been offered without interruption. The degree of Doctor of Philosophy was also announced for a time and twice conferred. In the middle nineties this degree was withdrawn, and doctoral work was not offered again until 1936, when it was once more authorized by the trustees. In this same year the Graduate School was organized, with a graduate faculty which has full power to enact the necessary legislation governing the work of the School. The faculty is composed of the president and vice-president of the University and all professors and associate professors who give work for graduate credit. The rules and regulations of the faculty are administered by an executive committee composed of the president and vice-president of the University, the dean of the Graduate School, the executive secretary of the graduate faculty, and five elected members of the graduate faculty.

The Graduate School, in certain areas, offers to students with adequate preparation and abilities opportunity for advanced study of an intensive kind and for training in the methods of investigation and research, with a view to their development as scholars and independent investigators in the fields of their choice. The School also aims to serve the needs of teachers and prospective teachers in elementary and secondary schools by providing opportunity for advanced professional training and by preparing them for administrative positions.

Major work leading to the master's degree may be taken in the following fields: bacteriology, biology, chemical engineering, chemistry, civil engineering, education, electrical engineering, English, French, geology, Greek, history and government, industrial engineering, international relations, Latin, mathematics, mechanical engineering, metallurgical engineering, mining engineering, philosophy, physics, psychology, and Spanish. In the fields of accounting, economics, finance, German, and sociology, major work is not offered; but students majoring in other fields may take collateral work in these fields from the list of courses for advanced undergraduates and graduates ("100" courses).

Work leading to the doctorate is offered in the following fields: bacteriology, chemical engineering, chemistry, civil engineering, electrical engineering, English, geology, history, mathematics, mechanical engineering, metallurgical engineering, and physics.

Prospective students who are interested in graduate work in particular fields are in all cases advised to get in touch with the heads of the departments in question before attempting to register. Such consultation will be to their benefit in that they will get a definite understanding as to the adequacy of their preparation, as well as of the facilities which the University has to offer for work in their fields.

Admission to Graduate Standing

A student who has taken the bachelor's degree or a degree in technology at a recognized college, university, or technical institution is eligible for admission as a graduate student. Actual admission is subject to enrollment limitations in each department, and is therefore competitive. Each candidate must file at the office of the director of admissions, on a form provided for the purpose, a statement of his collegiate experience and of his graduate objectives, and an official transcript of his academic record. The submission of Graduate Record Examination scores by a student applying for admission is urged. (For information about this examination, write to the Graduate Record Examination, 437 West 59th Street, New York 19, New York.)

A veteran of the armed services who does not have a degree may enter the Graduate School, provided he has attended a college of good standing and provided he stand the Graduate Record Examination set for the field in which he expects to specialize in the Graduate School and demonstrate to the head of the department concerned and to the dean of the Graduate School his fitness for graduate work.

Admission to graduate standing permits the student to take any course for which he has the necessary qualifications. It does not imply admission to candidacy for a degree. Admission to candidacy for an advanced degree is granted in accordance with the provisions set forth under "Degrees." Upon the recommendation of the department head concerned, if Graduate Record Examination scores have not been submitted, they may be required before a student is admitted to actual candidacy for an advanced degree.

Women are admitted as graduate students on the same terms as men. Except during a summer session, however, women are not permitted to attend, either as registered students or as listeners, courses intended primarily for undergraduates (courses numbered 1 to 99).

Students of Lehigh University who are within a few hours of meeting the requirements for the bachelor's degree may, if given permission by the graduate faculty, enroll for a limited amount of work for graduate credit.

Registration

Graduate students will ordinarily register for courses to be taken in a fall or spring semester during the registration period given in the University Calendar. Those who find it inconvenient to present themselves during the regular registration period, however, are granted the privilege of registering during the first few days of classes. Normally such students are expected to complete their registration before the close of the third day of instruction. All students taking work in a summer session are expected to present themselves for registration on the day or days specified in the University Calendar and the Summer Session Announcement for the particular session in which they wish to enroll. Registration after the tenth day of instruction in a regular semester or the fifth day in a summer session is permitted only when the express consent of the executive secretary of the graduate faculty has been obtained.

It should be noted that graduate work itself starts promptly at the beginning of the term, and it is frequently true that graduate courses can be given only if there is a certain minimum demand for them. Delay in enrolling for a given course may therefore cause the course to be withdrawn.

Tuition and Fees

The tuition for graduate courses is $15.00 per semester hour, less a discount of 20% for persons actively engaged in the teaching profession.

Where the major department requires a master's thesis, the student registers for the thesis and pays at the rate of the regular semester hour charge, the minimum fee being $30.00 (less 20% for teachers in active service).

Graduate students in residence who have met all course and residence requirements for the doctoral degree pay a dissertation fee of $50.00 per semester.

For a doctoral dissertation prepared in absentia a reading fee of $50.00 is charged those graduate students who have not paid a dissertation fee of at least $50.00 while in residence.

Part-time graduate students are given the option of paying or not paying an athletic fee of $5.00 per semester and a student activities fee of $2.50 per semester. If they pay these fees, they obtain the corresponding benefits.

Refunds

For University regulations concerning refunds, see page 44.

Members of the University Staff

Full-time members of the University staff may not take more than six semester hours of graduate work in any one semester; half-time members of the staff may not take more than ten semester hours. Students under contract to devote not more than one-third of their time to University employment may take a maximum of thirteen semester-hours per semester.

Filing of Application for Degree

Candidates for degrees on University Day file with the registrar on or before May 15 a written notice of candidacy for the degree; candidates for degrees on Founder's Day file a similar notice of candidacy on or before September 10, candidates for degrees at the Midyear Commencement file on or before January 10. A blank to be used for this purpose is supplied by the registrar's office. Failure to file such notice by the dates mentioned debars the candidate from receiving the degree at the ensuing graduation exercises.

DEGREES

Master of Arts and Master of Science

The master's degree is granted to properly qualified students who complete satisfactorily a full year of advanced work. In meeting the requirements for the degree, the student must comply with the following regulations:

1. All work which is to be credited toward a master's degree must be done in actual and regular attendance at Lehigh University.

2. A minimum of thirty semester hours is required for the master's degree.

3. Each candidate for a degree must submit for the approval of the graduate faculty the program of courses he proposes to take to satisfy the requirements for the master's degree. This program must have the approval of the head of the major department, and all courses included which are not offered by the major department must also be approved by the heads of the departments concerned. Approval of the program by the graduate faculty signifies that the candidate has been formally admitted to candidacy for the degree.

4. At least eighteen of the required thirty semester hours must be taken in one department, which shall be the student's major department or field. The remaining twelve hours, or any part of them, may also be taken in the major department; or they may be taken in any other field in which courses for graduate credit are given, as the needs or interests of the student may indicate. The distribution of the work shall be made upon the advice and with the approval of the head of the major department. In all cases, the work for the master's degree must be taken under at least two instructors.

5. At least twelve of the eighteen semester hours required in the major department and at least fifteen of the thirty semester hours required for the degree must be taken in courses intended primarily for graduates ("200" course). Courses primarily for undergraduates are not accepted for graduate credit.

6. A thesis may be required by the major department. If required, the thesis shall not count for more than six semester hours. The credit to be allowed shall be fixed by the head of the major department. Two bound typewritten copies of the thesis (one of which shall be an original copy), approved by the faculty member under whom the work was done and by the head of the major department, shall be placed in the hands of the secretary of the graduate faculty at least two weeks before the day on which the degree is to be conferred. Information as to the form in which the thesis must be presented may be obtained from the librarian

of the University or from the executive secretary of the graduate faculty.

7. The master's degree is not granted unless the candidate has earned the grades A or B in at least eighteen hours of the work on his program. No course in which the grade earned is less than C is credited toward the degree.

When all requirements have been met, the candidate is recommended by the faculty to the trustees for the master's degree appropriate to the work pursued.

Doctor of Philosophy

The degree of Doctor of Philosophy is conferred on candidates who have demonstrated general proficiency and high attainment in a special field of knowledge and capacity to carry on independent investigation in that field as evidenced by the presentation of an acceptable dissertation embodying the results of original research. The requirements for the degree are more specifically set forth in the following regulations.

1. Time Requirements. A candidate ordinarily is expected to devote three or more academic years to resident graduate study. In no case is the degree awarded to one who has spent less than two full academic years in resident graduate work. Study for any specified period of time, however, is not in itself regarded as sufficient ground for the award of the degree.

Graduate work done in residence at other institutions will be accepted in partial fulfillment of the time requirements, provided such work is approved by the graduate faculty and by the departments concerned.

Work of fragmentary character scattered over a long period of years, or work completed many years before the student becomes a candidate for the degree is subject to special review by the graduate faculty. The extent to which such work may be credited towards the fulfillment of the time requirements will be decided by the faculty.

2. Residence Requirements. A candidate for the degree must complete at least one full academic year of resident graduate study at Lehigh University.

3. Admission to Candidacy. Candidates for the doctorate are accepted in a limited number of departments only, and a

department may limit the number of candidates accepted in any year. In exceptional cases new students may be admitted to candidacy immediately upon registration in the Graduate School. Ordinarily, however, they are required to spend at least one semester in residence before they are accepted as candidates. Admission to candidacy is granted by the graduate faculty, following written application by the student, upon the recommendation of the departments concerned. In passing upon a student's application, his general education, as well as his special qualifications for work in his chosen field, is taken into consideration. Each applicant is notified by the executive secretary of the graduate faculty, in writing, of the action of the faculty upon his application.

The application of a foreign student must be accompanied by a statement from the department in which he intends to specialize, certifying that he has a satisfactory command of English.

At the time of admission to candidacy a special committee is appointed by the executive committee of the graduate faculty to direct the work of the candidate.

4. Plan of Work. Preparation for the degree is based on the study of a major subject, to which one or two minors may be added. The program of work, to be formulated by the candidate, his special committee, and the head of his major department, should be planned to lead to a general mastery of the major field and to a significant grasp of any minor that may be added. The program must be approved by the executive committee of the graduate faculty.

While there is no definite requirement as to the number of courses to be taken, two years devoted to formal courses is the customary minimum. In no instance, however, is the degree awarded merely for the faithful completion of any program of courses.

5. Language Requirements. The candidate must give evidence, through examination, of a reading knowledge, sufficient for the purposes of his special studies, of at least two foreign languages (in addition to any language which may constitute his major subject). In each case the required languages are designated by the candidate's major department and approved by the graduate faculty. The language requirements must be satisfied

before the student presents himself for the general examination, described below.

Language examinations are in charge of a committee consisting of representatives of the language department concerned and of the candidate's major department.

Permission to take language examinations does not imply admission to candidacy for the degree.

6. GENERAL EXAMINATION. The general examination for the doctorate is designed to test both the student's capacity and his proficiency in his field of study. The examination is not necessarily confined to the content of courses that have been taken at Lehigh University or elsewhere. It is ordinarily held not earlier than toward the close of the second year of work, nor later than seven months prior to the time when the candidate plans to receive the degree. The student's special committee is in charge of the examination, which is both written and oral.

Application for admission to the general examination must be filed with the executive secretary of the graduate faculty at least one month before the time of the examination. No student is permitted to take this examination who has not been admitted to candidacy for the doctorate or who has not satisfied the language requirements.

Should a candidate fail in the general examination, he may be permitted by the graduate faculty to present himself for a second examination not earlier than five months after the first. If the results of the second trial are also unsatisfactory, no further examination is set.

7. DISSERTATION. The candidate is required to present a dissertation prepared under the general direction of a professor at Lehigh University. The dissertation must treat a topic related to the candidate's major subject, embody the results of original research, give evidence of high scholarship, and constitute a contribution to knowledge. It must be approved by the professor under whose direction it was written, by the candidate's special committee, and by the graduate faculty. A copy bearing the written approval of the professor in charge must be presented to the executive secretary of the graduate faculty for transmission to the student's special committee not later than May 1, if the degree is to be conferred in June, not later than September 1, if

the degree is to be conferred in October, and not later than December 18 if the degree is to be conferred in February.

The candidate is required to deposit with the executive secretary of the graduate faculty, at least one week before the degree is to be conferred, (1) two typewritten copies (one an original copy) of the accepted dissertation in standard form and binding; (2) an abridgement of the dissertation in a form suitable for publication and acceptable to the candidate's special committee. At the same time he must deposit with the bursar of the University the sum of fifty dollars ($50.00). This deposit is refunded if the dissertation, or an acceptable summary including all its major results, is published within two years after the degree is awarded, in a place and form approved by the executive secretary of the graduate faculty. Otherwise the deposit is used by the University to defray the cost of printing and distributing the original abridgement. The period of two years may be extended at the discretion of the graduate faculty.

8. Final Examination. After the dissertation has been accepted by the graduate faculty, the candidate is examined orally by the officers of professorial rank in the departments concerned and such other persons as may be selected by the candidate's special committee. This examination ordinarily is held at least ten days prior to the date on which the degree is to be conferred.

The candidate must arrange the time for the examination with the executive secretary of the graduate faculty. Such arrangement must be made not later than May 1 if the degree is to be conferred in June, not later than June 1 if the degree is to be conferred in October, and not later than December 18 if the degree is to be conferred in February.

9. Conferring of Degree in Absentia. The degree of Doctor of Philosophy will not be conferred in absentia unless the candidate is excused by the president of the University.

Postdoctoral Work

Students who have completed the requirements for the doctorate may enroll for postdoctoral individualized study under the guidance of selected members of the faculty. Such a program of study contemplates a broad educational and research development at advanced and mature levels, and provides opportunities to prepare for specific positions. A formal certification of such work as may be accomplished by the student will be made.

Description of Courses

DESCRIPTION OF COURSES

Following is a list of undergraduate and graduate courses offered by Lehigh University. For purposes of record, all approved courses are listed. It must be understood, however, that the offerings in any given semester are contingent upon a number of factors, including student needs as determined at the time of preregistration.

Credit Hours

The number in parentheses following each course title indicates the credit value of the course in terms of semester-hours. Three hours of drawing, of work in the laboratory, or of practice in the field are regarded as the equivalent of a recitation or lecture of one hour's duration.

Course Numbering

Courses bearing the numbers 1-99 are intended for undergraduates, those numbered 100-199 for graduate students and advanced undergraduates, and those in the "200" group for graduate students only.

Prerequisites

Prerequisites are of two kinds: primary prerequisites, which are strictly essential, and secondary prerequisites, which are highly desirable but not absolutely essential. Secondary prerequisites may be waived by the head of the department concerned. In the following descriptive paragraphs, primary prerequisites are printed in italics and secondary prerequisites in roman type. For all "100" courses junior standing is a primary prerequisite.

ACCOUNTING

Professors Cowin, Bratt, and Allen
Assistant Professor Koch
Messrs. Roberts, Jurgensen, Mustain, Kubelius, and C. L. Moore

ACCOUNTING

Acctg. 1. Accounting (3)

The elementary principles of accounting, with problem work to develop a knowledge of accounting method and practice. Financial statements and their preparation, analysis and recording of transactions, journalizing and posting, use of special ledgers and journals, adjusting and closing accounts. First and second semesters.

Acctg. 2. Accounting (3)

Elementary accounting problems peculiar to proprietorships, partnerships, and corporations; manufacturing enterprises; depreciation; and a more detailed consideration of financial statements than is possible in Acctg. 1. Prerequisite: *Acctg. 1.* First and second semesters.

Acctg. 4. Accounting for Engineers (3)

An intensive course in the principles and practices of accounting, covering the fundamentals in one semester. Especially designed for engineering students. Prerequisite: *junior standing.* First and second semesters.

Acctg. 6. Cost Accounting for Engineers (3)

A one semester course in cost finding and cost analysis, designed especially for engineering students. Cost elements, costing methods, and the use of cost data for purposes of cost control. Prerequisite: *Acctg. 2 or 4.* Second semester.

For Advanced Undergraduates and Graduates

Acctg. 113. Intermediate Accounting (3)

Problems of the balance sheet, its form and content, the valuation of assets, liabilities, and problems relating to capital stock, surplus, and reserves. Prerequisites: *Acctg. 2 or 4.* First semester Mr. Cowin

Acctg. 114. Intermediate Accounting (3)

Problems of profit and loss statements, income, receiverships and bankruptcy, estates, and consolidated statements. Prerequisites: *Acctg. 2 or 4;* Acctg. 113. Second semester. Mr. Cowin

Acctg. 115. Cost Accounting (3)

The principles and methods used to determine unit costs of product or services. Material, labor, and overhead costs, methods of distributing overhead, and the application of cost principles to job order and process production. Prerequisite: *Acctg. 2 or 4.* First semester. Mr. Koch

Acctg. 118. Advanced Cost Accounting (3)

Special cost problems such as: standard costs, distribution costs, joint costs. The managerial use of cost data, control of costs, and design of cost accounting systems. Prerequisite: *Acctg. 115.* Second semester.
Mr. Koch

Acctg. 119. Specialized Accounting Systems (3)

Charts of accounts and the adaptation of accounting principles to business enterprises in various industries. Prerequisite: *Acctg. 113 or 115.* First semester. Mr. Allen

Acctg. 120. Auditing (3)

The different types of audits and special investigations. Problems involving audit principles and procedure; methods of detecting and preventing fraud; the writing of audit reports; the ethics and the legal responsibilities of accountants. Prerequisites: *Acctg. 113;* Acctg. 114. Second semester. Mr. Allen

Acctg. 171. Readings in Accounting (3)

An unrostered course designed for students in the College of Arts and Science majoring in accounting, and for students in the College of Business Administration having special interest in some phase of accounting not covered by the rostered courses. The study may be in the history of accounting, accounting theory, municipal or public utility accounts, or any special subject approved by the instructor. Prerequisites: *senior standing, 12 credit hours in accounting, and consent of the head of the department.* First semester. Messrs. Allen, Bratt, Cowin, Koch

Acctg. 172. Readings in Accounting (3)

Continuation of Acctg. 171. Prerequisites: *senior standing, 12 credit hours in accounting, and consent of the head of the department.* Second semester. Messrs. Allen, Bratt, Cowin, Koch

ECONOMIC STATISTICS

For Advanced Undergraduates and Graduates

E.S. 145. Statistical Method (3)

The methods of statistical description and induction, including tabular and graphic analysis and presentation. Prerequisite: *Eco. 4.* First semester. Mr. Bratt

E.S. 146. Business Cycles and Forecasting (3)

The nature of the business cycle and the application of statistics to business trends, with special attention to forecasting and business barometers. Prerequisite: *E.S. 145.* Second semester. Mr. Bratt

E.S. 147. National Income Analysis (3)

Analysis of the problem of measuring economic categories such as industrial growth, national income, price variation, and demand. The significance of data; method. Prerequisite: *E.S. 146.* First semester. Mr. Bratt

E.S. 148. Advanced Business Cycles (3)

Recent business cycle theories; the evolution of the theories, and the problems of economic change which the theories attempt to explain. Prerequisite: *E.S. 146.* Second semester. Mr. Bratt

E.S. 152. Advanced Statistical Method (3)

Sampling and correlation methods employed in industry and government. Prerequisite: *E.S. 145 or approved equivalent.* Second semester.

E.S. 171. Readings in Economic Statistics (3)

An unrostered course designed for students with special interests in some field of economic change or economic forecasting. Prerequisite: *E.S. 146 and consent of the head of the department.* First semester. Mr. Bratt

E.S. 172. Readings in Economic Statistics (3)

Continuation of E.S. 171. Prerequisite: *E.S. 146 and consent of the head of the department.* Second semester. Mr. Bratt

LAW

Law 1. Business Law (3)

The law of contracts, sales, negotiable instruments, and bankruptcy. First semester.

Law 2. Business Law (3)

The law of partnership, corporations, property, agency, insurance, transportation, bailments, patents, copyrights, and trademarks. Prerequisite: *Law 1.* Second semester.

For Advanced Undergraduates and Graduates

Law 103. Federal Tax Law (3)

The most recent revenue acts; procedure in using the law and regulations to determine the amount of the tax liability for individuals, partnerships, trusts, and corporations. Prerequisite: *Acctg. 2 or 4.* First semester.
Mr. Koch

ASTRONOMY

See Mathematics and Astronomy

ATHLETICS

See Division of Athletics and Physical Education

BIOLOGY

Professor S. J. Thomas
Associate Professors Trembley, Parker, and Owen
Assistant Professor Grainger
Mr. Ritter

Biol. 1. Biology (3)

General distribution requirement for arts students who do not intend to major in biology. A general course in biological types and principles. Two lectures and one laboratory period per week. First semester.

Biol. 3. Comparative Vertebrate Anatomy (3)

A course in vertebrate zoology with emphasis on the study of homologous body structures in the various vertebrate classes and their relationship to the functional demands of habit and environment in each class. Detailed dissections of representative vertebrates are made in the laboratory. One lecture and two laboratory periods each week. Prerequisites: *Biol. 31 and 32, or the equivalent.* First semester.

Biol. 4. Vertebrate Embryology (3)

A study of reproduction from germ cell formation through establishment of the principal organ systems of the vertebrate body. Various mechanical and physiological problems confronting the growing embryo are considered, and direct observations of whole-mounts, sections and living material are made in the laboratory. Two lectures and one laboratory period each week. Prerequisites: *Biol. 31 and 32, or the equivalent;* Biol. 3. Second semester.

Biol. 6. Botany (3)

Fundamentals of the morphology and physiology of plants. The evolutionary development of the plant kingdom. Two lectures and one laboratory period per week. Field trips in the spring. Second semester.

Biol. 11. Animal Ecology (3)

A recitation, lecture, laboratory, and field course in the fundamentals of animal taxonomy and conservation. Basic interrelationships between animals and their physical and biological environments, animal successions, type habitats, and economic ecology. Laboratory work in the morphology of the invertebrate phyla and the classes of vertebrates. Observations of animals in their local habitats. Prerequisite: Biol. 1 or its equivalent. Second semester.

Biol. 13. Human Biology (3)

A lecture course in biological principles as illustrated by man. Man in relation to his environment, the organ systems of man, population biology, parasitism, elements of human inheritance and human evolution. First and second semesters.

Biol. 14. Genetics and Eugenics (1)

Designed for students who are not majoring in biology. Hereditary mechanisms, concept of the gene, mutation theory, mechanism of evolution and human evolution. One lecture per week. First or second semester.

Biol. 15. Freshman Hygiene

Four lectures on social hygiene, with the cooperation of the director of the students' health service. Given during freshman week. Required of all non-veteran freshmen. Either this course or Biol. 16 must be passed before graduation.

Biol. 16. Social Hygiene

For non-veteran students who have not passed Biol. 15. Second semester.

Biol. 18. Genetics (2)

A study of the basic laws governing inheritance in plants and animals, chromosome behaviour, nature of genes. The relation of environmental modifications, hybrid variation, and mutations to the mechanics of evolution. Prerequisites: Biol. 31, 32, or the equivalent. Second semester.

Biol. 20. Physiology (3)

Recitations and demonstrations covering the principles underlying the operation of life-processes. The subject matter is not limited to any one group of organisms, but is derived from living things in general. Prerequisites: Biol. 31, 32; Chem. 150; Phys. 12, 16, 17. Second semester.

Biol. 21. Hygiene (3)

A recitation course in the physiology and anatomy of the human body. The evolution and development of organs and systems; their structures, functions, and interrelationships as a scientific basis for appropriate attitudes and habits concerning health. Second semester.

Biol. 22. Hygiene (1)

A brief course in the essentials of personal and public health. Designed especially for students who will become responsible for the health habits of others under their supervision or command. First semester.

Biol. 23. Hygiene (1)

A continuation of Biol. 22. Second semester.

Biol. 31. Zoology (3)

A foundation course for majors in biology. Living things are studied from a functional rather than a purely morphological viewpoint. Protoplasm, cellular metabolism, reproduction, and other fundamental conceptions of life-processes. Recitations, lectures, and laboratory. First semester.

Biol. 32. Zoology (3)

A continuation of Biol. 31. Second semester.

Biol. 33. Biology and Organic Evolution (3)

A lecture and recitation course in animal biology with special reference to man. A survey of the lower forms of life and their evolution; the biology of the individual and of populations; genetics and human evolution. First semester.

Biol. 34. Biology and Organic Evolution (3)

A continuation of Biol. 33. Second semester.

Biol. 36. Economic Botany (3)

Economic products of plant origin from the point of view of their development, structural characteristics, uses, and sources. Two recitations and one laboratory period per week. First semester.

Biol. 50. Sanitary Bacteriology (3)

Study of bacteria and allied microörganisms by staining and cultural methods; their sanitary importance in public water supplies; the bacteriology of sewage and sewage treatment; qualitative and quantitative bacteriological and biological analysis of water, milk, and sewage. Lectures, recitations, and laboratory. Second semester.

Biol. 52. Bacteriology (3)

Elementary general bacteriology. The morphological and cultural characteristics of bacteria and allied microörganisms; special attention to forms of sanitary and economic importance; the role of bacteria, yeasts, and molds in fermentation industries, in water and milk. Lectures, recitations, and laboratory. First semester.

Biol. 55. Biology of Bacteria (3)

A recitation and laboratory course in the study of life processes, using bacteria for demonstration. Cell structure, growth and reproduction, heredity and variation, metabolism, adaption and parasitism, etc., as examples of the relationships of all living things. Second semester.

Biol. 61. Bacteriology (3)

An elementary course for students specializing in biological sciences. Special staining methods in the study of morphology; differential media in bacterial physiology; thorough study of staining, cultural and biochemical properties of the microörganisms themselves rather than their specific sanitary or industrial importance. Recitations, lectures, and laboratory work. First semester.

Biol. 62. Bacteriology (3)

Continuation of Biol. 61.

For Advanced Undergraduates and Graduates

Biol. 106. Natural History and Ecology (3)

Identification and life habits of local plants and animals; laboratory training in the use of analytical keys and of collections of reference, and the correct methods of making collections; trips to local regions of natural interest for field identification and study of interrelationships of living organisms; conservation, conservation programs, and appreciation of nature. Three lectures, one laboratory, and one field trip a week. Not available as part of a graduate major in biology. Summer session.

Mr. Trembley

Biol. 113. Histology (3)

The techniques of preservation and preparation of animal tissues for microscopical study; comparative studies of fresh and preserved vertebrate tissues. One lecture and two laboratory periods per week. Prerequisite: Biol. 31 or its equivalent. Second semester. Mr. Owen

Biol. 153. Advanced Bacteriology (3)

A continuation course for students majoring in bacteriology. A laboratory and recitation course in the study of bacterial species. The morphological, cultural and biochemical characteristics of a few species are studied in detail. Prerequisite: *Biol. 61 or equivalent.* Second semester.

Messrs. Grainger, Thomas

Biol. 155. Industrial Bacteriology (3)

An advanced laboratory course in bacteriology including aspects of industrial chemistry in which bacteria play an essential part in the process, as in the manufacture of acetone, butanol, acetic, and lactic acids. Prerequisites: at least two years of chemistry, including quantitative analysis; Biol. 52 or 61. Second semester. Messrs. Parker, Thomas

Biol. 158. Immunology (3)

A comprehensive recitation course in the study of the antigen-antibody reaction as a broad biological phenomenon. Emphasis is laid on the fundamental response of the tissue cell to foreign substances rather than on any medical application. Prerequisite: Biol. 153. First semester. Mr. Thomas

Biol. 161. Public Sanitation (3)

A laboratory study of the biological, chemical, bacteriological, and physical aspects of public water supplies, systems of sewage disposal, and milk distribution. Prerequisites: at least two years of chemistry, including quantitative analysis; Biol. 50, 52, or 61. First semester. Mr. Thomas

For Graduates

Prerequisite for graduate work in biology: the amount of biology usually required for an undergraduate major in that department. Prerequisite for graduate work in bacteriology: a satisfactory undergraduate course in bacteriology and sufficient preparation in organic chemistry. Ability to undertake graduate work must be demonstrated by previous scholastic record, an examination, or both.

Biol. 203. Vertebrate Histogenesis and Organogensis (3)

Careful laboratory work on the development of a vertebrate; tracing of the history of the germ-layers, organs, and tissues; the association of tissues to form organs. First semester. Mr. Owen

Biol. 207. Biological Research (3)

Investigations in any phase of the biological sciences according to the student's preparation and interests. First semester.
Messrs. Grainger, Owen, Parker, Thomas, Trembley

Biol. 208. Biological Research (3)

Continuation of Biol. 207. Second semester.
Messrs. Grainger, Owen, Parker, Thomas, Trembley

Biol. 209. Advanced Morphology (3)

A laboratory course in special phases of morphology, such as comparative osteology, comparative morphology, or embryology of the invertebrates, etc., to meet the individual interest of the student. First or second semester. Mr. Owen

Biol. 210. Biological Theories (3)

An advanced course in genetics and evolution. First semester.
Messrs. Thomas, Trembley

Biol. 211. General Cytology (3)

Conference, assigned readings, and laboratory work on the structural features of the cell in relation to cellular function and on modern methods of preparing living and fixed tissues for cytological study. Prerequisite: *Biol. 113 or equivalent.* First or second semester. Mr. Owen

Biol. 212. Field Zoology (3)

Methods of biological survey work; animal censuses; collection, preparation, and care of zoological speciments; the use of keys; study of the interrelationships existing between the groups of local animals, especially the vertebrates, and of their habitat preferences. Lectures, laboratory work, and field trips. Second semester. Mr. Trembley

Biol. 213. Problems in Field Zoology (3)

Concentrated work in the life history study of one or more local species. To be taken concurrently with or following Biol. 212, depending upon the previous experience and interest of each student. First or second semester. Mr. Trembley

Biol. 230. Antibiotic Substances (3)

Fundamentals of the interrelationships among microbial populations; preparation and evaluation of penicillin and similar substances. Two lectures and one laboratory period per week. Prerequisites: *Biol. 61, Chem. 150, or their equivalents.* Second semester. Mr. Parker

Biol. 256. Industrial Mycology (3)

An advanced laboratory course in mycology, including aspects of industrial chemistry in which yeasts and molds play an essential part in the process, such as in the manufacture of industrial alcohol, citric acid, etc. Prerequisite: Biol. 155 or equivalent. Second semester Mr. Parker

Biol. 260. Serology (3)

A laboratory course in the preparation of antigens, immunization of animals, and the study of antigen-antibody reactions. To be taken concurrently with or following Biol. 158. Prerequisite: Biol. 153. First or second semester. Mr. Thomas

Biol. 262. Microbiology (3)

A recitation and laboratory course in the study of the higher bacteria, yeasts, molds, algae, and protozoa of interest to the bacteriologist. Practical applications to sanitary bacteriology, water supplies, sewage disposal systems and food spoilage. First or second semester. Mr. Parker

Biol. 263. Physiology of Bacteria (3)

The biochemistry of bacterial metabolism, zymology, respiration, nutrition, reproduction. First or second semester. Messrs. Grainger, Thomas

Biol. 264. Epidemiology (3)

A seminar dealing with historic epidemics of typhoids, cholera, plague, diphtheria, and the venereal diseases; the methods of transmission of the organisms concerned with mass infections; modern immunological and sanitary practice in prevention. First or second semester. Mr. Grainger

Biol. 265. Industrial Biology (3)

A laboratory course in the preparation and standardization of biological products used in active immunization, diagnosis, and serum therapy. Prerequisites: Biol. 158 and 260. First or second semester.

Messrs. Grainger, Thomas

Biol. 266. Public Health Administration (3)

The organization of national, state, and local health services; relationship between official and volunteer health agencies; functions of medical health officer, epidemiologist, public health nurse, and sanitary inspectors in a public health program; various phases of health work, such as eugenics, personal, social and industrial hygiene, sanitation, vital statistics, and public education. First or second semester. Mr. Thomas

Biol. 267. History of Bacteriology (3)

Reading, conferences, and written reports. First or second semester.

Mr. Thomas

Biol. 268. History of Biology (3)

Reading, conferences, and written reports. First or second semester.

Mr. Trembley

BUSINESS ADMINISTRATION

See Accounting, Economics and Sociology, and Finance

CHEMISTRY AND CHEMICAL ENGINEERING

Professors Neville, W. W. Ewing, Theis, Simmons, Anderson, Hazlehurst, Serfass, Amstutz, and D. E. Mack
Associate Professors Billinger, Zettlemoyer, Smull, and Fornoff
Assistant Professors Easton and Fish
Messrs. Rhoda, Uhl, Chessick, Clewell, Galperin, Jeffrey, Kutsher, Litchtenwalner, Maus, Metro, Mikovsky, Miles, P. E. Miller, Moffat, Muraca, Richards, Rivard, Rudzinski, W. G. Thomas, and Travers

CHEMISTRY

Chem. 4. General Chemistry (4)

The principles and applications of general chemistry; descriptive chemistry of the non-metals and their important compounds. One demonstration lecture, two recitations, one laboratory period. First and second semesters.

Chem. 5. General Chemistry (4)

Continuation of Chem. 4. Principles and applications of general chemistry; descriptive chemistry of the metals and their compounds. One demonstration lecture, two recitations, one laboratory period. Prerequisite: *Chem. 4.* First and second semesters.

Chem. 15. Elementary Chemistry (3)

An abridgment of Chem. 4. For students not majoring in science or engineering. Two lecture-recitations, one laboratory period. First semester.

Chem. 16. Elementary Chemistry (3)

Continuation of Chem. 15; an abridgement of Chem. 5. Two lecture-recitations, one laboratory period. Prerequisite: *Chem. 15 or Chem. 4.* Second semester.

Chem. 33. Analytical Chemistry (3)

Theory and practice of qualitative and quantitative analysis; qualitative analysis by semi-micro methods; gravimetric and volumetric quantitative procedures. Prerequisites: *Chem. 4 and 5.* First semester.

Chem. 34. Analytical Chemistry (3)

Continuation of Chem. 33. Volumetric precipitation procedures; oxidation-reduction titrations; electrolytic and electrometric methods of analysis. Prerequisites: *Chem. 4 and 5;* Chem. 33. Second semester.

Chem. 37. Analytical Chemistry (2)

An abridgment of Chem. 33 for mining and metallurgical engineers. Prerequisites: *Chem. 4 and 5.* First semester.

Chem. 43. Analytical Chemistry Conference (1)

Lectures and recitations concerning the scientific foundations and laboratory practice of Chem. 33. Prerequisites: *Chem. 4 and 5.* First and second semesters.

Chem. 44. Analytical Chemistry Conference (1)

Continuation of Chem. 43. Lectures and recitations to accompany Chem. 34. Prerequisites: *Chem. 4 and 5;* Chem. 43. Second semester.

Chem. 47. Analytical Chemistry Conference (1)

Lectures and recitations to accompany Chem. 37. Prerequisites: *Chem. 4 and 5.* First semester.

Chem. 91. Physical Chemistry (3)

Introduction to physical chemistry; states of matter, change of state, solutions, surface phenomena; nuclear, atomic, and molecular structure. Prerequisites: *Chem. 4 and 5; Math. 13.* First semester.

Chem. 92. Physical Chemistry Laboratory (1)

Physical chemical measurements. To acompany Chem. 91. Prerequisites: *Chem. 33 or 37; Phys. 22; Math. 13.* First semester.

Chem. 93. Elements of Physical Chemistry (3)

Kinetic theory, change of state, solutions, equilibria, electrochemistry, colloidal phenomena. Especially designed for biology majors. Prerequisites: *Chem. 4 and 5.* Second semester.

Chem. 97. Research Chemistry Laboratory (3)

Advanced study or an investigation involving intensive work in laboratory and library. Topics in active research include adsorption, analytical processes, drying oils, engineering processes, heterocyclic organic compounds, hydration of inorganic salts, kinetics of combustion, photomicrography, natural and synthetic resins, pigments, aldol syntheses, plastics, surface chemistry, tanning and leather technology, and X-ray technique. Second semester.

Chem. 99. Research Chemistry Laboratory (2)

An abridgment of Chem. 97. Second semester.

For Advanced Undergraduates and Graduates

Chem. 102. Inorganic Chemistry (3)

Family relationship among the elements; systematic survey of inorganic chemical compounds, their occurrence, properties, and reactions. Prerequisites: *Chem. 4 and 5*. First or second semester. Mr. Fornoff

Chem. 134. Radiation Methods (2)

The application of radiation methods, mainly X-ray methods, to chemical and industrial chemical problems. Prerequisite: senior standing. First semester. Mr. Anderson

Chem. 135. Radiation Methods (2)

Continuation of Chem. 134. Amplification of X-ray diffraction methods; space groups; crystal chemistry. Prerequisite: senior standing. Second semester. Mr. Anderson

Chem. 137. Advanced Analytical Chemistry (3)

One conference and two laboratory periods per week. Prerequisite: 8 hours of quantitative analysis. Second semester. Mr. Serfass

Chem. 139. Advanced Analytical Chemistry (2)

Similar to Chem. 137. Lecture and conference only. Prerequisite: 8 hours of analytical chemistry. Mr. Serfass

Chem. 144. Radiation Methods Laboratory (1)

Laboratory in connection with Chem. 134. Prerequisite: senior standing. First semester. Mr. Anderson

Chem. 145. Radiation Methods Laboratory (1)

Continuation of Chem. 144. Prerequisite: senior standing. Second semester. Mr. Anderson

Chem. 150. Organic Chemistry (3)

Systematic survey of the typical compounds of carbon, their classification and general relations; study of synthetic reactions. Prerequisites: *Chem. 5 and 33*. First semester. Mr. Easton

Chem. 151. Organic Chemistry (3)

Continuation of Chem. 150. Prerequisite: Chem. 150. Second semester. Mr. Amstutz

Chem. 156. Quantitative Organic Analysis (1)

The practice of the common analytical procedures involving the quantitative estimation of carbon, hydrogen, halogen, nitrogen and sulfur; the iodine number method; the hydroxyl value; the acid value, and the saponification number. One laboratory period. Prerequisites: *Chem. 34, 44;* Chem. 150, 165. First semester. Mr. Fish

Chem. 157. Qualitative Organic Analysis (3)

The theory and practice of the identification of pure organic compounds. The preparation of derivatives and the separation of mixtures of organic compounds. One lecture and two laboratory periods. Prerequisites: *Chem. 150, 165;* Chem. 151, 167. First semester. Mr. Easton

Chem. 158. Advanced Organic Chemistry (3)

Continuation of Chem. 151. Advanced topics in organic chemistry. Prerequisites: *Chem. 150, 151, 165, and 166 or 167.* First or second semester. Mr. Amstutz

Chem. 165. Organic Chemistry Laboratory (2)

Preparation of pure organic compounds. Prerequisites: *Chem. 5;* Chem. 33. First semester. Messrs. Amstutz, Easton, Smull

Chem. 166. Organic Chemistry Laboratory (3)

Continuation of Chem. 165. Practical methods of saturation, nitration, reduction, diazotization, sulphonation, etc.; preparation of pure compounds; study of the properties of dyes and other commercial products. Prerequisite: Chem. 165. Second semester. Messrs. Amstutz, Easton, Smull

Chem. 167. Organic Chemistry Laboratory (2)

Similar to Chem. 166, but shorter. Prerequisites: *Chem. 5;* Chem. 33 and 165. Second semester. Messrs. Amstutz, Easton, Smull

Chem. 168. Advanced Organic Laboratory (2)

The synthesis, characterization, structure determination, and ultimate analysis of organic compounds. Prerequisites: Chem. 165, and 166 or 167. First semester. Messrs. Amstutz, Easton

Chem. 169. Industrial Biochemistry Laboratory (1)

Laboratory work to accompany Chem. 171. Prerequisites: Chem. 150, 165. First semester. Messrs. Fish, Theis

Chem. 171. Industrial Biochemistry (3)

The inorganic, organic, and physical chemistry of life processes and their products, atomic and molecular structure, equilibria, colloidal state, catalysis, osmosis, synthesis, oxidation, and reduction as applying to carbohydrates, proteins, fats, lipoids, and their interrelations, This course may be taken without Chem. 169. Prerequisites: Chem. 150, 151, 165, and 166 or 167. First or second semester. Mr. Fish

Chem. 172. Industrial Biochemistry (3)

Continuation of Chem. 171, with special adaptations to tanning, foods, fermentation industries, sanitation, and sewage disposal. Second semester. Mr. Theis

Chem. 179. History and Literature of Chemistry (1)

Chronological development of the science with assigned reading. Survey of reference books and journals. Second semester. Mr. Billinger

Chem. 190. Physical Chemistry (3)

Continuation of Chem. 91. Study of the laws of thermochemistry, solutions, rates of reaction, and chemical equilibrium in homogeneous and heterogeneous systems based on thermodynamic and kinetic concepts. Prerequisites: *Math. 13, Phys. 23 and 24, or 16 and 17;* Math. 14, Chem. 91. First semester. Messrs. Ewing, Zettlemoyer

Chem. 192. Physical Chemistry Laboratory (1)

Continuation of Chem. 92. Prerequisites: *Chem. 91; Phys. 23;* Chem. 92. Second semester. Messrs. Ewing, Rhoda

Chem. 194. Physical Chemistry and Electrochemistry (3)

Continuation of Chem. 190. The laws of conductivity, current electromotive force and energy relations of electrolytes in solutions and in the molten state. Prerequisites: *Math. 13, Phys. 23 and 24, or 16 and 17;* Math. 14, Chem. 190. First or second semester. Mr. Ewing

Chem. 197. Electrochemistry Laboratory (1)

Experimental study of electrochemical reactions. Measurements of conductivity, current and electromotive force. Prerequisites: *Math. 13, Chem. 33 or 37, Phys. 23 and 24, or 16 and 17;* Math. 14, Chem. 190. Second semester. Messrs. Ewing, Rhoda

For Graduates

The prerequisites for graduate work in chemistry as a major study toward the doctorate or the master's degree are: inorganic chemistry and qualitative analysis (8), quantitative analysis (8), organic chemistry (10), physical chemistry (8), physics (12), and mathematics, including calculus (12). Students of exceptional ability may be able to make up minor deficiencies while carrying graduate work. If the deficiencies are serious, a student can hardly expect to complete the requirements for the master's degree within the minimum time.

Graduate students may choose either chemistry or chemical engineering as the major subject. If chemical engineering is the major subject, a number of courses in chemistry, adapted to the needs of the student, will be taken as collateral work. Other subjects may be chosen in related fields, usually physics and mathematics. Men majoring in chemistry will take collateral work in science, or such other fields as may be suited to their objectives.

Chem. 200. Inorganic Chemistry Research (4)
Investigations in the field of organic and colloid chemistry.
Messrs. Hazlehurst, Fornoff, Neville

Chem. 201. Inorganic Chemistry Research (4)
Continuation of Chem. 200. Second semester.
Messrs. Hazlehurst, Fornoff, Neville

Chem. 202. Advanced Inorganic Chemistry (3)
The periodic system and atomic structure; theories of valence, with particular attention to the Werner theory of complex compounds; inorganic free radicals; reactions in non-aqueous media; and study of the properties and reactions of certain elements, with emphasis on recent developments. First semester. Mr. Fornoff

Chem. 203. Advanced Inorganic Chemistry (3)
Continuation of Chem. 202. Second semester. Mr. Fornoff

Chem. 220. Advanced Physical Chemistry (3)
Definitions and fundamental laws of thermodynamics; statistical thermodynamics; chemical equilibria in homogeneous and heterogeneous systems; colligative and partial molal properties of solutions; electrochemistry of solutions. Prerequisites: Chem. 190, 194 or equivalent. First semester.
Messrs. Ewing, Hazlehurst

Chem. 221. Advanced Physical Chemistry (3)
Kinetic theory of gases, liquids, and solutions; reaction rate theory; heterogeneous reactions and catalysis; properties of dispersed systems; phenomena of surface chemistry; preparation and general properties of colloidal systems. Prerequisites: Chem. 190, 194 or equivalent. Second semester. Messrs. Neville, Zettlemoyer

Chem. 230. Quantitative Analysis Research (4)
Investigation of problems in analytic procedures. First semester.
Mr. Serfass

Chem. 231. Quantitative Analysis Research (4)
Continuation of Chem. 230. Second semester. Mr. Serfass

Chem. 232. Advanced Analytical Chemistry (3)

Theory of precipitation analysis; physico-chemical methods; microanalysis; chromotography; organic-analytical reagents; accuracy and precision in analysis. Prerequisites: Chem. 33, 34, 43, 44 or equivalent. Second semester. Mr. Serfass

Chem. 236. X-ray Research (3)

The investigation of chemical and industrial problems by X-ray diffraction methods. First semester. Mr. Anderson

Chem. 237. X-ray Research (3)

Continuation of Chem. 236. Second semester. Mr. Anderson

Chem. 249. Seminar in Analytical and Physical Chemistry (1)

Reports and discussions of recent developments in analytical and physical chemistry. Messrs. Ewing, Serfass, Zettlemoyer

Chem. 252. Organic Chemistry: Heterocyclic Compounds (3)

The chemistry of thiophene, pyrrole, furan, pyridine, and their derivatives, considered from the viewpoint of recent organic theories of structure and reaction mechanisms. Second semester. Mr. Amstutz

Chem. 258. Topics in Organic Chemistry (3)

An intensive study of some special fields of organic chemistry. Messrs. Amstutz, Easton, Smull

Chem. 259. Seminar in Organic Chemistry (1)

Reports and discussions of recent important developments in theoretical and applied organic chemistry. Messrs. Amstutz, Easton, Smull

Chem. 260. Organic Chemistry Research (4)

Investigation of a problem in organic chemistry. First semester. Messrs. Amstutz, Easton, Smull

Chem. 261. Organic Chemistry Research (4)

Continuation of Chem. 260. Second semester. Messrs. Amstutz, Easton, Smull

Chem. 263. Physical Organic Chemistry (3)

A study of the fundamental properties of organic molecules, including quantum-mechanical resonance, spectroscopy, dipole moments and thermodynamics; the use of these physical measurements in the solution of problems in organic chemistry. Mr. Zettlemoyer

Chem. 266. Advanced Organic Preparations (2)

Mainly a laboratory course. Second semester. Messrs. Amstutz, Easton, Smull

Chem. 271. The Chemistry of the Proteins (3)

A study of the proteins, amino acid, and nucleic acids, their properties, composition, degradation products, oxidation and other chemical reactions, synthesis, and analysis. Second semester. Mr. Theis

Chem. 272. The Chemistry of the Carbohydrates (3)

A study of the simple and complex sugars, starches, and cellulose, their synthesis, analysis, reactions, biological relations, occurrence, and industrial applications. First semester. Mr. Theis

Chem. 273. Seminar in the Chemistry of Leather (1)

Reports and discussions of principles of protein chemistry and tanning processes as related to the production of leather. Mr. Theis

Chem. 290. Physical Chemistry Research (4)

Investigation of a problem in physical chemistry; vapor pressure and calorimetric studies in the constitution of inorganic salts. Prerequisites: the equivalent of Chem. 190, 193, 194. First semester.
Messrs. Ewing, Zettlemoyer

Chem. 291. Physical Chemistry Research (4)

Continuation of Chem. 290. Second semester.
Messrs. Ewing, Zettlemoyer

Chem. 293. Theoretical Chemistry: Kinetics (3)

Kinetics of explosions of solids; combustion and explosion of hydrogen and hydrocarbons; polymerization; kinetics of organic reactions. First semester. Mr. Zettlemoyer

Chem. 295. Theoretical Chemistry: Thermodynamics (3)

Statistical theory of thermodynamics; heat capacity equations; quantum theory in chemical thermodynamics; reports and discussions on selected topics. Second semester. Mr. Hazlehurst

Chem. 297. Surface Chemistry (3)

Applications of colloid chemistry; contact catalysis; special topics. Lectures and seminar. Second semester. Mr. Neville

Chem. 298. Advanced Physical Chemistry Seminar (3)

An intensive study of some field of physical chemistry. First and second semesters. Messrs. Ewing, Zettlemoyer

Chem. 299. Physical Chemistry Methods (2)

Advanced course in methods of physical chemistry laboratory practice. Prerequisite: the equivalent of Chem. 193 and 197. First semester.
Mr. Ewing

CHEMICAL ENGINEERING

Ch.E. 70. Industrial Stoichiometry (3)

Chemical and physical calculations applied to industrial processes, involving heat, energy, and material balances, vaporizing and condensation, solubility and crystallization, fuels and combustion. Prerequisites: Math. 13; Chem. 33 and 43. Second semester.

Ch.E. 78. Chemical Engineering (3)

Principles of chemical engineering related to fluid flow, materials, handling, disintegration and mechanical separation. Assigned reading in texts and current literature on industrial process. Prerequisites: *Ch.E. 70; Math. 13;* Math. 14; Chem. 33 and 43. First semester.

Ch.E. 79. Chemical Engineering (3)

A continuation of Chem. 78, including heat generation and exchange. Two lectures and one laboratory period weekly. Prerequisites: *Math. 14;* Chem. 91 or 102; Chem. 34, 44, and 150; Ch.E. 78. Second semester.

Ch.E. 80. Industrial and Engineering Chemistry (3)

Introduction to chemical engineering principles through a study of unit process operations in various chemical industries. Prerequisites: *Chem. 33 and 43;* Math. 14. Second semester.

For Advanced Undergraduates and Graduates

Ch.E. 180. Chemical Engineering (3)

A continuation of Ch.E. 79, including phase change separation, design and cost data on unit processes and manufacturing plants. Visits to industrial plants in the Philadelphia area for inspection of large units are a part of the course. Two lectures and one laboratory period weekly. Prerequisites: *Chem. 34, 44, and 150; Ch.E. 78;* Chem. 91 or 93, and 151; Ch.E. 79. First semester. Mr. Simmons

Ch.E. 181. Chemical Engineering (3)

Continuation of Chem. 180. Visits to industrial plants in the New York area are a part of the course. Prerequisites: *Ch.E. 79 and M.E. 29;* Chem. 180, 190, and 193. Second semester. Mr. Simmons

Ch.E. 183. Unit Processes (3)

The chemical reactions, equipment, and operation conditions of industrial processes, involving alkylation, amination, diazotization, esterification, halogenation, hydrolysis, nitration, polymerization, sulfonation, etc. Prerequisites: *Chem. 150; C.E. 78 or Ch.E. 80;* Chem. 151. First semester. Mr. Mack

Ch.E. 185. Chemical Engineering Practice (1)

Comprehensive studies in nearby manufacturing plants of a few processes, involving one or more unit engineering operations. These studies usually occupy time covering whole days or multiples thereof. Prerequisite: Ch.E. 180. Second semester. Mr. Simmons

Ch.E. 186. Chemical Engineering Thermodynamics (2)

Industrial applications of thermodynamics. Principles of fluid flow applied to gases, high pressure calculations, gaseous equilibria, reaction velocities. Prerequisites: *Chem.190; Ch.E. 79; M.E. 29.* Second semester. Mr. Mack

For Graduates

Ch.E. 280. Industrial Chemistry and Chemical Engineering Research (4)

Investigation of a problem in chemical engineering or in industrial chemistry. Prerequisites: for problems in industrial chemistry, as in the statement above introductory to graduate courses; for investigation of a problem in chemical engineering, an undergraduate curriculum in chemical engineering substantially equivalent to the curriculum in this University. First semester. Messrs. Mack, Simmons, Theis

Ch.E. 281. Industrial Chemistry and Chemical Engineering Research (4)

Continuation of Ch.E. 280. Second semester. Messrs. Mack, Simmons, Theis

Ch.E. 282. Chemical Engineering (3)

Advanced consideration of chemical engineering energetics, hydrodynamics and heat transfer applied to filtration, classification, and extraction. Prerequisites: courses substantially equivalent to the undergraduate curriculum in chemical engineering in this University. First semester. Mr. Simmons

Ch.E. 283. Chemical Engineering (3)

Continuation and amplification of Ch.E. 282. Studies in evaporation, refrigeration, and crystallization. Second semester. Mr. Simmons

Ch.E. 284. Chemical Engineering (3)

Continuation and amplification of Ch.E. 282 and 283. Studies in absorption and distillation. Given in alternate years. First semester.

Ch.E. 285. Chemical Engineering (3)

Continuation and amplification of Ch.E. 282 and 283. Studies in combustion, drying, hygrometry, and air conditioning. Given in alternate years. Second semester. Mr. Simmons

Ch.E. 286. Chemical Engineering Process Control (3)

A study of the fundamentals of primary sensing elements and their application to the measurement, recording, and control of temperature, pressure, concentration, humidity, fluid flow rate and other variables. Discussion of telemetering systems, electronic and mechanical recording systems, pneumatic, and electromatic indicating and controlling elements. Second semester. Mr. Serfass

Ch.E. 288. Chemical Engineering Process Design (3)

The application of chemical engineering principles in the design of unit process equipment, involving such processes as evaporation, distillation, drying, filtration, and absorption and the coordination of such units into organized production. Prerequisites: courses substantially equivalent to the undergraduate curriculum in chemical engineering in this University. First semester. Messrs. Mack, Simmons

Ch.E. 289. Chemical Engineering Process Design (3)

Continuation of Ch.E. 288. Second semester. Messrs. Mack, Simmons

CIVIL ENGINEERING

Professors Eney, Sutherland, C. D. Jensen, and B. G. Johnston
Associate Professors Fuller, Payrow, Beer, and West
Assistant Professors Kleinschmidt, P. F. Miller,
Kaar, Kolm, McPherson, and A. C. Loewer
Messrs. Beedle, Crispen, Muhlhausen, Liebig, Neal,
Sanders, Swayne, Ashley, Brown, deNeufville,
Topractsoglou, Dinsmore, Jacobsen,
Thürlimann, and Dittig

CIVIL ENGINEERING

C.E. 2a. Engineering Drawing (1)

A brief course in the elements of descriptive geometry designed for those students who have taken C.E. 1 or pass an anticipatory examination in engineering drawing (excluding descriptive geometry), but who require credit for C.E. 3 according to the terms of their programs.

C.E. 3. Engineering Drawing and Descriptive Geometry (3)

The use of drawing instruments; instruction in engineering lettering; the theory and practice of mechanical drawing and descriptive geometry; complete working and assembly drawings; tracing and reproduction of drawings; intersections and developments. The student who presents evidence of training in engineering drawing may take an anticipatory examination (excluding descriptive geometry) and receive two semester hours credit, if successful in passing the examination. See C.E. 2a. First and second semesters.

C.E. 6. Land and Topographic Surveying (4)

The theory and practice of land surveying, including computation of areas, dividing land, map drawing, and topographic signs; field work with level and transit; theory and use of stadia. A recitation and seven hours of field work each week-day for four weeks. Prerequisites: *plane trigonometry,* C.E. 3. Summer session.

C.E. 6a. Land and Topographic Surveying (3)

An abridgment of C.E. 6, designed primarily for students in the curriculum of mining engineering. A recitation and seven hours of field work each week-day for three weeks. Prerequisites: *plane trigonometry,* C.E. 3. Summer session.

C.E. 15. Structural Theory: Stresses (4)

Algebraic and graphic determination of stresses in roof and bridge trusses under dead, live, and wind loads. Prerequisite: Mech. 11.

C.E. 16. Highway Engineering (3)

The location, construction, and maintenance of roads and pavements; highway design. Prerequisite: C.E. 6. Second semester.

C.E. 29. Industrial Employment

During the summer following the junior year, students are required to spend at least eight weeks in approved shop work or on engineering construction. A written report on the shop work or project, outlining the experience obtained is due on return from Christmas recess. The reports should contain plans, photographs, or calculations, as each case may require.

C.E. 30. Structural Design (3)

Design of mine structures in steel and wood. An elective course for mining engineers. Prerequisite: Mech. 11. Second semester.

C.E. 31a. Route Surveying (3)

Reconnaissance, preliminary and location surveys; theory and practice concerning simple, spiral, and vertical curves; railway switches; establishment of grades and setting of slope stakes; mass diagrams. Prerequisite: C.E. 6. First semester.

C.E. 35. Advanced Surveying (3)

Adjustment of instruments; investigation of systematic and observational errors; elements of least squares with application to surveying adjustment of level nets and triangulation; solar and polar observations; field work in triangulation, determination of azimuth, precise leveling, and with the plane table; brief treatment of mine surveying and photogrammetry. Prerequisite: C.E. 6. First semester.

C.E. 40. Engineering Conference

Required of seniors in the curriculum of civil engineering. Second semester.

For Advanced Undergraduates and Graduates

C.E. 100. Engineering Valuation and Economy (3)

The determination of probable life, earning power, and present worth of public and private industrial properties. Prerequisites: senior standing in engineering; Fin. 25; Acctg. 4, previously or concurrently. Second semester. (Not offered 1949-1950.)

C.E. 101. Foundations (2)

Design and construction of foundations for bridges and buildings. Prerequisites: *Mech. 11;* Geol. 6. Second semester.

C.E. 110. Readings in Civil Engineering (1-3)

Study of selected technical papers with abstracts and reports.

C.E. 113. Special Problems (2-4)

Supervised individual research problems with report. First or second semester.
Messrs. Eney, Jensen, Johnston

C.E. 118. Structural Theory (3)

Study of the principles of design of structural members of steel. Concurrent with C.E. 119. Prerequisites: *Mech. 11;* C.E. 15; Mech. 12. First semester. Messrs. Eney, Kolm

C.E. 119. Structural Design (3)

Application of the principles studied in C.E. 118 to the design both of individual structural members and certain complete structures, principally a plate girder bridge, a steel building frame, and a truss bridge. Prerequisite: *C.E. 118 concurrently.* First semester. Messrs. Eney, Kolm

C.E. 120. Structural Design (2)

Wood construction. Prerequisite: C.E. 118. Second semester. Mr. Eney

C.E. 124. Structural Theory (3)

An introduction to the study of stresses in indeterminate structures. Prerequisite: *C.E. 15.* First semester. Messrs. Eney, Loewer, Sutherland

C.E. 125. Reinforced Concrete Design (3)

Theory of reinforced concrete; design of reinforced concrete buildings, bridges and retaining walls. Prerequisite: C.E. 124. Second semester. Messrs. Fuller, Loewer, Sutherland

C.E. 126. Concrete Laboratory (1)

The manufacture, properties, and testing of cement, mortar, and concrete; tests on reinforced concrete beams and columns. Prerequisite: *Mech. 11.* Second semester. Messrs. Fuller, Loewer

C.E. 128. Sanitary Engineering (3)

Fundamental principles of the design of water supply and sewage systems and of water and sewage treatment plants. Prerequisites: Mech. 21 or Ch.E. 78. First semester. Mr. Payrow

C.E. 129. Sanitary Engineering Design (3)

Continuation of C.E. 128. Detailed design of water and sewage systems, including the complete design of a water and a sewage treatment plant. Prerequisite: C.E. 128. Second semester. Mr. Payrow

C.E. 130. Sanitary Engineering Laboratory (1)

Laboratory tests of water and sewage as applied to the operation of water and sewage plants. Visits of inspection are made to nearby water and sewage treatment plants. Prerequisite: C.E. 128. Second semester. Mr. Payrow

C.E. 131. Advanced Sanitary Engineering (3)

Engineering and public health; consideration of such matters as garbage and refuse collection and disposal, street cleaning methods, air conditioning, insect-borne diseases, rural sanitation, public health administration. Prerequisite: C.E. 128. Second semester. Mr. Payrow

C.E. 133. Transportation Engineering (3)

Study and design of transportation facilities, including highways, airways, railroads, and waterways, with emphasis on highway and airport design. Laboratory work includes studies of the suitability of various soils for subgrades. Prerequisites: C.E. 16; Mech. 11. Second semester.
Mr. Jensen

C.E. 133a. Transportation Engineering (2)

An abbreviation of C.E. 133 for students electing the Hydraulics and Sanitary Options. Prerequisites: C.E. 16, Mech. 11. Second semester.
Mr. Jensen

C.E. 135. Structural Welding (1)

The design of welded steel structures together with a study of current literature. A few periods will be devoted to the manual operation of making welds. Prerequisite: senior standing in civil or mechanical engineering. Second semester. Mr. Jensen

C.E. 136. Soil Mechanics (3)

An introduction to the study of the mechanics of soils, including soil classification, permeability, compressibility, shear strength, bearing capacities, stability of embankment, pressures against retaining walls. Prerequisite: Mech. 11. First semester. Mr. Jensen

C.E. 141. Hydraulic Engineering (3)

Analysis and design of pump equipment, gravity dams, control gates, flumes and penstocks. Prerequisites: Mech. 21, Mech. 23. First semester.
Mr. McPherson

C.E. 142. Hydraulic Machinery (3)

Design of the essential elements of the reaction turbine. Prerequisites: Mech. 21, Mech. 23. Second semester. Mr. McPherson

For Graduates

The following courses are open to engineering graduates only. The prerequisite for any course listed is a course of similar title on a less advanced level. Math. 217 and 218, Theory of Elasticity, Math. 229 and 230, Advanced Analytic Mechanics, and Mech. 201, Advanced Analytical Mechanics, may be included in a graduate major.

C.E. 201. Advanced Structural Theory (3)

The design and investigation of statistically indeterminate structures of steel and reinforced concrete, including arches. First semester.
Messrs. Eney, Sutherland

C.E. 202. Advanced Structural Theory (3)

Continuation of C.E. 201. Second semester. Messrs. Eney, Sutherland

C.E. 203. Plain and Reinforced Concrete (3)

Critical review of recent research; correlation of research with analysis and design. Given in alternate years. First semester.
Messrs. Johnston, Loewer

C.E. 207. Sanitary and Hydraulic Engineering (3)

Study of the design of reservoirs, tanks, and pipe lines for water supply systems, and of sewers and other appurtenances for sewage systems; inspection of existing plants, with reports thereon. First semester.
Mr. Payrow

C.E. 208. Sanitary and Hydraulic Engineering (3)

Continuation of C.E. 207. Second semester. Mr. Payrow

C.E. 209. Structural Seminar (3)

Study of current discussion in the field of structural theory and design. First semester. Messrs. Eney, Sutherland

C.E. 210. Structural Seminar (3)

Continuation of C.E. 209. Second semester. Messrs. Eney, Sutherland

C.E. 211. Structural Dynamics (3)

Response of structures to impact and vibration; applications to engineering design. Second semester. Mr. Johnston

C.E. 212. Research Methods (3)

Research procedures as applied to engineering materials and structures; methods of experimental stress analysis. First semester. Mr. Johnston

C.E. 213. Structural Research (2-5)

Individual research problems with reports. First or second semester.
Messrs. Eney, Jensen, Johnston

C.E. 214. Mechanical Methods of Stress Determination (3)

Use of mechanical devices in investigation of special problems, such as temperature deformations, foundation displacements, and integral action of structures; theory of similitude. First semester. Mr. Eney

C.E. 216. Plate and Shell Structures (3)

Analysis and design. Applications to both reinforced concrete and steel construction. Given in alternate years. Second semester. Mr. Johnston

C.E. 217. Foundation Engineering (3)

Design of foundations for airport runways; stabilization of soil by cement and tar; unwatering of foundations; bearing capacity of soils; settlement predictions. Prerequisite: *C.E. 136 or the equivalent.* Second semester. Mr. Jensen

C.E. 218. Structural Metals (3)

Yielding and fracture theories; creep; impact tests; repeated stress; selection of alloys in design. Second semester. Mr. Johnston

C.E. 219. Structural Welding (3)

Continuous and non-continuous construction with welded connections; distortion effects; current research. Given in alternate years. First semester.
Mr. Jensen

C.E. 221. Structural Members and Frames (3)

Elastic and inelastic behavior of structures and their components. Problems in stress analysis, bending, torsion and stability. First semester.
Mr. Johnston

C.E. 222. Structural Members and Frames

Continuation of C.E. 221. Second semester. Mr. Johnston

C.E. 225. Structural Model Analysis (2-5)

Individual structural research problems, with report. Prerequisite: C.E. 214. Second semester. Mr. Eney

C.E. 231. Hydrodynamics (3)

Fundamentals of fluid motion; flow phenomena in closed and open channel; advanced practical problems. First semester.

C.E. 232. Run-Off and Stream-Flow (3)

Hydrologic studies; soil conservation, flood prevention and control, hydraulic structures. First semester. Mr. McPherson

C.E. 233. Hydraulic Laboratory Practice (2-5)

Study of theory and methods of hydraulic experimentation simultaneously with laboratory work. Second semester. Mr. McPherson

C.E. 235. Hydraulic Research (2-5)

Individual research problems with reports. First and second semesters.
Mr. McPherson

C.E. 236. Soils Research (2-5)

Individual research problems relating to soil mechanics, with reports. Prerequisite: C.E. 136 or the equivalent. First or second semester.
Mr. Jensen

MECHANICS

Associate Professor Beer
Assistant Professors Kleinschmidt, P. F. Miller, and A. C. Loewer
Messrs. Sanders, Swayne, Muhlhausen, deNeufville, Neal,
Topractsoglou, Dinsmore, Jacobsen, Thürlimann, and Dittig

Mech. 1. Statics (3)

Composition and resolution of forces; analysis of force systems in equilibrium; friction; center of gravity. Prerequisite: *Math. 12.* First semester.

Mech. 2. Dynamics (3)

Kinematics and kinetics of translation and rotation, of plane motion; moment of inertia; relative motion; work; power; energy; impulse and momentum. Prerequisites: *Mech. 1;* Math. 13. Second semester.

Mech. 3. Statics and Dynamics (3)

A condensation of Mech. 1 and Mech. 2. Prerequisite: *Math. 12.* First and second semesters.

Mech. 11. Mechanics of Materials (3)

Strength and elasticity of materials; theory of stresses and strains; deflection of beams and shafts; torsion; buckling of struts. Prerequisites: *Mech. 1 or Mech. 3;* Math. 14. First and second semesters.

Mech. 12. Advanced Mechanics of Materials (3)

Further topics in column and beam theory, including unsymmetrical bending, curved beams, and elastic foundations; torsion of non-circular cross-section. Prerequisite: *Mech. 11.* Second semester.

Mech. 13. Materials Testing Laboratory (1)

Experiments on wood, iron, and steel to determine the action of materials under stress and to study the physical properties of materials of construction. Prerequisite: *Mech. 11, previously or concurrently.* First and second semesters.

Mech. 21. Mechanics of Fluids (3)

The behavior of real fluids and the more important physical laws; potential flow, laminar flow, boundary layer, turbulence, and waves, with practical applications to flow through orifices, and to weirs and pipes, open channels, turbines and pumps. Prerequisites: *Mech. 2;* Math. 14. First and second semesters.

Mech. 23. Hydraulics Laboratory (1)

Experiments in the flow of water and in the testing of hydraulic machinery. Prerequisite: *Mech. 21 or Ch.E. 78, previously or concurrently.* First and second semesters.

For Advanced Undergraduates and Graduates

Mech. 101. Advanced Dynamics (3)

Elements of vector analysis, including sum and products of vectors, gradient, divergence, curl; application to equilibrium and motion of a point and a rigid body; fundamental dynamical theorems and their application to engineering problems, moving frames of reference, impulsive forces, gyroscopic motion; introduction to generalized coordinates, Lagrange's equations. Prerequisites: *Mech. 2 or 3;* Math. 106. Mr. Beer

Mech. 125. Aerodynamics (3)

Fundamentals of fluid mechanics applied to wing and propeller theory and to the drag of airplane parts; the Prandtl theory of lift and drag; principles of similitude, with application to wind tunnel tests. Prerequisites: *Math. 14; Mech. 2 or 3.* First semester. Mr. Beer

Mech. 126. Aerodynamics (3)

Dynamics of the airplane; performance calculations; climbing, gliding, and other types of flight; theory of stability and control. Prerequisite: *Mech. 125.* Second semester. Mr. Beer

For Graduates

Mech. 201. Advanced Analytical Mechanics (3)

Fundamental dynamical theorems and their application to advanced problems; gyroscopic motion; generalized coordinates, Lagrange's equations, fixed and moving constraints; non-holonomic systems, principle of least constraint; Hamilton's canonical equations, principle of least action; general methods of integration of the dynamical equations, integral invariants, Poisson brackets. Mr. Beer

ECONOMIC STATISTICS

See Accounting

ECONOMICS AND SOCIOLOGY

Professor Diamond
Associate Professors F. B. Jensen and Jacobi
Assistant Professors R. M. Davis and Snider
Messrs. Bryski, Skerrett, Fyfe, R. W. Smith, and Velesz

ECONOMICS

Eco. 1. Industrial Evolution (3)

An introductory course outlining the gradual development of economic organization with special attention to the stages of economic progress and social institutions growing out of these stages. First semester.

Eco. 3. Economics (3)

A general course in the principles of economics, covering the fundamental forces governing the production, distribution, and consumption of wealth. The work deals with the basic institutions of economic life, the nature of production, the organization of productive enterprise, and the principles of value and price. Prerequisite: sophomore standing. First and second semesters.

Eco. 4. Economics (3)

A continuation of Eco. 3, in which the work deals with the principle of money and banking, the distribution of income, and important economic problems such as the business cycle, international trade, labor problems, social security, public finance, and alternative economic systems. Prerequisite: Eco. 3. First and second semesters.

Eco. 11. Marketing (3)

A detailed and critical analysis of the principles of marketing, designed to acquaint the student with major institutions and functions involved in the distribution of goods and services from the producer to the consumer. Prerequisites: *Eco. 3;* Eco. 4. First semester.

Eco. 15. Retailing (3)

A study of modern retail institutions; principles and methods of retail organization and management; economic, social, and legislative aspects of the retailing structure. Prerequisite: *Eco. 11.* Second semester.

Eco. 50. Economic Geography (3)

A survey of world resources and world trade, with special reference to the chief economic materials and the geographic and economic factors responsible for the position of the United States in the economic world. Second semester.

Eco. 60. Insurance (3)

A non-mathematical course in the economic principles and business practice of insurance, particularly life, fire, and casualty insurance. Prerequisite: *Eco. 4.* First semester.

For Advanced Undergraduates and Graduates

Eco. 106. Intermediate Economic Theory (3)

Determination of prices in terms of the equilibrium of the business enterprise and consumer choices in markets of varying degrees of competition; determination of wages, rent, interest, and profits; interactions of consumption, savings, employment, and income. Prerequisite: Eco. 4. First or second semester. Mr. Davis

Eco. 107. Advanced Economics (3)

An advanced course in the principles of economics, dealing especially with the theory of the distribution of wealth, the nature of the productive process, the history of economic doctrines, and proposed plans for economic reform, such as socialism. Prerequisite: *Eco. 4.* First semester. Mr. Davis

Eco. 108. Advanced Economics (3)

Continuation of Eco. 107. Prerequisite: *Eco. 4.* Second semester. Mr. Davis

Eco. 113. Advertising (3)

The principles, practices, and problems of advertising with special reference to its social and economic aspects. Prerequisite: *Eco. 11*. First semester. Messrs. Smith, Snider

Eco. 114. Selling and Sales Management (3)

The principles and practices of modern selling and sales management; the function of distribution in modern management. Prerequisite: *Eco. 11 or consent of the instructor*. Second semester. Mr. Snider

Eco. 133. Labor Problems (3)

The economics of labor; the history of labor movements in the United States, forms of labor organizations, and the methods and policies of trade unions. Prerequisite: *Eco. 4*. First semester. Messrs. Diamond, Skerrett

Eco. 134. Labor Problems (3)

A continuation of Eco. 133. The relations of labor to the courts; social and labor legislation; unemployment, employee health, accidents, personnel work, etc. Prerequisites: *Eco. 4;* Eco. 133. Second semester.
Messrs. Diamond, Skerrett

Eco. 135. Transportation (3)

The economics of transportation by rail, highway, water, pipeline, and air; effects of transport costs on prices and on location of industries and markets; rate theory and practice; regulation, finance, government ownership, and coordination. Prerequisite: *Eco. 4*. First semester. Mr. Skerrett

Eco. 136. Public Utilities (3)

Rate-making, finance, combination, public ownership, federal power policy, and related problems in the electric, gas, and telephone industries. Prerequisite: *Eco. 4*. Second semester. Mr. Skerrett

Eco. 171. Readings in Economics (3)

Readings in various fields of economics, designed for the student who has a special interest in some field of economics not covered by the regularly rostered courses. Prerequisites: senior standing and consent of the head of the department. First semester. Messrs. Davis, Diamond, Jensen, Snider

Eco. 172. Readings in Economics (3)

Continuation of Eco. 171. Prerequisites: senior standing and consent of the head of the department. Second semester.
Messrs. Davis, Diamond, Jensen, Snider

SOCIOLOGY

Soc. 51. Social Institutions (3)

A one-semester course outlining the fundamental institutions of the social order, with special reference to their origin, growth, and present interrelations. Intended primarily for freshmen and sophomores in the College of Arts and Science. First semester.

For Advanced Undergraduates and Graduates

Soc. 161. Sociology (3)

The nature and growth of social institutions, with emphasis on evolution, racial developments, social stratification, and the social problems connected with the institutions of private property, family organization, and sex. First semester. Mr. Jacobi

Soc. 162. Social Problems (3)

Special problems of contemporary society, including population trends, crime, public health, poverty, child welfare, the handicapped, etc. Second semester. Mr. Diamond

Soc. 171. Readings in Sociology (3)

Readings in various fields of sociology, designed for the student who has a special interest in some field of sociology not covered by the regularly rostered courses. Prerequisites: senior standing and consent of the head of the department. First semester. Messrs. Diamond, Jacobi

Soc. 172. Readings in Sociology (3)

Continuation of Soc. 171. Prerequisite: senior standing and consent of the head of the department. Second semester. Messrs. Diamond, Jacobi

EDUCATION

Professors H. P. Thomas and Congdon
Associate Professor Bream
Assistant Professors Teal and Peterkin
Messrs. Hayward, L. R. Johnston, Palevicz, Hahn
F. G. Armstrong, Watkins, and Dessenberger

Educ. 0. Effective Study Methods (0)

A practical course in study techniques and in the tools of study, including reading and fundamentals of mathematics, as the needs of individual students may require. An extensive testing program is carried on to assist the student in adjusting himself. Prerequisite: *consent of the instructor.* Second half of first semester.

Educ. A. Effective Study Methods (3)

A continuation of Educ. 0. Prerequisite: Educ. 0. Second semester.

Educ. 1. Introduction to Education (3)

A general introduction to the field of education, giving a broad survey of the work of the teacher and of the public schools. Required for the college provisional certificate. Should be taken during the junior year or earlier. First and second semesters.

Educ. 20. Educational Psychology (3)

An introductory course furnishing a psychological foundation immediately related to educational problems and practice. Practical problems involving analysis of designated material are assigned regularly for solution and report. Required for the college provisional certificate. Should be taken during the junior year. Prerequisite: *Psych. 1.* Second semester.

Educ. 51. Principles of High School Teaching (3)

Basic methods of secondary instruction, including the objectives of education in relation to the curriculum; socialized procedure; problem-project method; contract plans; types of teaching related to different fields; directed study; organization of courses around criticized objectives; and the conduct of classes along the lines of individualized instruction. Recommended for the college provisional certificate. Should be taken with Educ. 53. Prerequisites: Educ. 1 and 20. First semester.

Educ. 53. Observation of Secondary School Teaching (3)

Study, directed observation, and discussion of the various phases of teaching activity in high schools in or near Bethlehem. The class meets two hours each week. In addition, detailed reports are required for sixty observation periods. Required for the college provisional certificate. Prerequisites: Educ. 1 and 20; Educ. 51 concurrently. First semester.

Educ. 54. Practice Teaching of Secondary School Subjects (3)

An intensive practical application of the principles of teaching to classroom conditions. The class meets two hours each week, in sections according to major interests, for the study of teaching procedure, actual organization, and planning of courses around definite objectives. A minimum of sixty periods of acceptable supervised practice in classroom instruction is required. Students must have at least one free hour at the same time each day throughout the week. Required for college provisional certificate. Prerequisites: *Educ. 53 and fifteen semester hours in each subject the candidate expects to teach.* Second semester.

Educ. 56. Practice Teaching of Secondary School Subjects (3)

A continuation of Educ. 54 required of students who desire certification in New Jersey. Teaching must be done in a field for which practice teaching credit has not been granted previously. Prerequisites: *Educ. 53 and fifteen semester hours in the subject the candidate expects to teach.* Educ. 54 may be taken concurrently. Second semester.

For Advanced Undergraduates and Graduates

Educ. 121. The Diagnosis and Adjustment of Reading Difficulties (3)

The psychology of reading as related to learning difficulties; the fundamental skills of reading, including eye movements, the measurement and diagnosis of reading difficulties, and recent experiments with remedial procedure; practice in the development of material for remedial instruction. Prerequisite: *consent of the instructor.* First or second semester.

Messrs. Hahn, Hayward

Educ. 130. History of Education in Europe (3)

A survey of the Greek, Roman and early Christian periods; late medieval and early modern periods; European movements since the French Revolution and their implications for American education. Second semester.

Educ. 131. History of Education in the United States (3)

The development of primary, secondary, and higher education in the United States; the aims, curricula, methods, and systems of education through five periods, from Colonial times to the present, in relation to the social conditions and processes. First semester. Mr. Thomas

Educ. 140. Principles of Elementary Education (3)

The aims, organization, and materials of elementary education; characteristics of elementary school pupils; and a general treatment of the problems of elementary education. Mr. Bream

Educ. 150. Principles of Secondary Education (3)

An introductory course in the field of secondary education. The aims, organizations, and materials of secondary education; characteristics of secondary school pupils; and a general treatment of the problems of secondary education. Recommended for the college provisional certificate. Prerequisite: *consent of the instructor.* Second semester. Mr. Peterkin

Educ. 151. Organization of Materials of Instruction (3)

A practical course for the teacher in service, offering opportunity for cooperative planning of courses and units of instruction. Applying the principles of curriculum construction to the selecting, assembling, and organizing of materials of instruction. The teacher is expected to work in his field of special interest. Prerequisite: *consent of the instructor.* Second semester. Mr. Bream

Educ. 171. Elementary Educational Statistics (3)

Designed to give teachers and administrative officers the techniques necessary to enable them to gather data and present the results of their work in their classrooms and schools. Provides a practical knowledge of the simpler statistical methods for use in handling common problems and in understanding educational literature. Prerequisite: *consent of the instructor.* First semester. Messrs. Armstrong, Thomas

Educ. 173. Diagnostic and Remedial Teaching (3)

The analysis and treatment of difficulties in the various subjects. The student may select any subject in which he has adequate background as his field of work. Practice is given in the development of materials, and actual work with failing pupils is expected. Prerequisite: *consent of the instructor.* Summer session. Mr. Dessenberger

Educ. 190. Visual Instruction (3)

Types of visual aids, the special value of each, their use in different subjects, the psychological basis for the use of such material, and the standards for the selection of visual sensory aids. Required for the permanent college certificate. May be completed as an undergraduate course or after graduation before application is made for the permanent college certificate. Second semester. Mr. Peterkin

Educ. 191-192. Workshop (3, 5, or 6)

Cooperative study of current educational problems. Designed to provide elementary and secondary school teachers an opportunity to work at their own teaching levels and in their own fields. Students will be limited to one workshop during a summer session but may eventually register for more than one, provided there is no duplication in subject matter. Summer session.

For Graduates

The major in education on the graduate level is intended for students preparing for school administration and supervision and for other types of public school positions. Preparation is offered for such positions as superintendent of schools, supervising principal, elementary principal, secondary principal, and vocational counselor. All work is approved by the state councils of education of Pennsylvania and New Jersey.

At least four semester courses in education are prerequisite for a graduate major in this field. The prerequisites may be taken concurrently with a partial major program. Attention is called to Educ. 121, 130, 131, 150, 151, 171, 173, and 190, all of which are open to advanced undergraduates and graduate students, and which may be taken as part of a major or as collateral work in education.

Educ. 219. Social Policy and Education (3)

A critique of the aims of education in the modern social order; the nature, needs, and adjustments of modern industrial society; the conflicting demands upon education by a changing civilization as represented by modern social points of view; the implications, for education, of contemporary American philosophy of democratic social progress. Prerequisite: *consent of the instructor.* First semester. Mr. Bream

Educ. 220. Advanced Educational Psychology (3)

Study and practice of techniques and methods involved in making a detailed psychological analysis of the pupil, particularly in relation to school problems. Prerequisite: *consent of the instructor.* Second semester.

Educ. 222. Education of Exceptional Children (3)

Methods of instruction and provision of materials for children who differ markedly from the normal, i.e., gifted, subnormal, and maladjusted;

the problems of the teacher in a system that makes little provision for the exceptional child. Actual case studies of pupils are required. Prerequisite: *consent of the instructor.* Second semester. Mr. Dessenberger

Educ. 223. Psychology of School Subjects (3)

An analysis of the psychological development and behavior of pupils in connection with school subjects at all levels. Diagnostic work. Each student has an opportunity to emphasize the subject of his special interest. Summer session.

Educ. 243. Elementary School Administration (3)

The major problems of organization and administration of elementary schools; types of organization, pupil promotion, time allotment, service agencies, and plant and equipment. Required for a principal's certificate. First semester. Mr. Hayward

Educ. 244. The Elementary School Curriculum (3)

Problems of curriculum development in the first six grades; subject matter placement, program-making for different types of schools, regular vs. special subjects, articulation, and similar problems. Second semester. Mr. Hayward

Educ. 246. Elementary School Supervision (3)

Methods, materials, organization, and evaluation of supervision. Each student will be required to develop a supervisory program for a subject or a school. Second semester. Mr. Bream

Educ. 247 A-F. Current Problems in Elementary School Subjects (3)

A. Reading and Language. B. Arithmetic. C. Social Studies. D. Science. E. Language Arts. F. Arts and Crafts. Selection, study and development of problems with reference to the various levels of the elementary school. Special attention will be given to students' classroom problems. Classes will be limited to a consideration of one subject. First and second semesters. Messrs. Bream, Hayward

Educ. 253. Secondary School Administration (3)

The major problems of organization and administration of secondary schools: program of studies, teaching staff, pupil personnel, plant and equipment, and community relationships. Required for a principal's certificate. Prerequisite: *Educ. 150 or its equivalent.* Second semester. Mr. Johnston

Educ. 254. The Secondary School Curriculum (3)

Related to Educ. 253, but organized in such a way that it may be taken independently. Methods of study of curriculum problems, the selection of subject matter in various fields, the principles of program construction, and similar problems. Prerequisite: *Educ. 150 or its equivalent.* Second semester. Messrs. Johnston, Peterkin

Educ. 256. Supervision in Secondary Schools (3)

Related to Educ. 253 and 254, but may be taken independently. The purpose of supervision, a program for the improvement of teaching, the evaluation of teaching, measurement, supervisory relationships, and similar problems involved in the supervision of instruction in secondary schools. Prerequisite: *Educ. 150 or its equivalent.* First semester. Mr. Johnston

Educ. 257. Modern Trends in Teaching (3)

Designed for the teacher in service and for principals who wish a knowledge of the most recent developments in the trends and techniques of teaching. Special attention is given to experimental studies in the field of method. Students will be sectioned on the basis of interest in elementary or secondary education. Prerequisite: *consent of the instructor.* First semester. Messrs. Hayward, Peterkin

Educ. 258. Extra-Curricular Activities (3)

A cooperative study in the philosophy and psychology supporting activity programs; their organization and administration. Emphasis will be given to the teacher's part in the program, e.g., clubs, student councils, homeroom and class organization, assemblies, publications, finance. First semester. Mr. Johnston

Educ. 263. Public School Administration (3)

A systematic treatment of the problems of administration, local, state, and national. The newer developments which are modifying educational administration: state authorization and organization, the board of education, the superintendent of schools, personnel management, business administration, financial support, and public relations. First semester.

Messrs. Thomas, Watkins

Educ. 264. Foundations of Curriculum Construction (3)

Principles of curriculum construction which underlie the reorganization of the program of studies for elementary and secondary schools. Consideration of the origin and background of the curriculum, methods of organization, state, county, and city programs, curriculum planning and development, techniques for developing materials, and similar pertinent topics. First semester. Messrs. Johnston, Peterkin

Educ. 266. Supervision of Instruction (3)

Analysis of the principles underlying the organization and supervision of instruction. Applications to specific teaching situations. No lines will be drawn between the elementary and the secondary school. Mr. Bream

Educ. 268. Vocational Education (3)

The social basis for vocational education; present practices and trends in the major types of vocational education; recommendations for organization and administration teaching problems; student employment; laws and regulations. Mr. Teal

Educ. 272. Educational Tests and Measurements (3)

Selection of educational tests, organization of a testing program, use of tests in classification, construction of classroom tests, use of tests in improving teaching, and diagnosis of pupil difficulties. Students will be sectioned on the basis of interest in elementary or secondary education. For advanced work in this field attention is called to the seminar and individual research courses. Second semester. Mr. Armstrong

Educ. 282. a-b. Educational and Vocational Guidance (3)

a. General Introduction (2).
General principles of guidance. Discovery of interests and abilities, study of occupations, study of educational opportunities, guidance activities, group programs, student personnel problems.

b. Organization of School Programs (1).
Analysis and development of homeroom programs, school programs, and community programs. Mr. Palevicz

Educ. 283. Techniques of Counseling (3)

An intensive examination of personnel techniques including interviews, rating scales, and counseling by such means as lectures, demonstrations, and case histories. Case studies of selected students are required. Required for guidance counselor's certificate. Messrs. Hahn, Palevicz

Educ. 284. Occupations (3)

Trends in supply and demand of workers in various occupations; requirements for occupations; sources of descriptive materials; testing for occupational aptitude. Required for guidance counselor's certificate.
Messrs. Hahn, Teal

Educ. 291-292. Seminars (3)

One seminar is organized in each half-year provided three or more students select such work. These courses do not duplicate the courses of individual research. It is the purpose of seminar courses to provide for cooperative study of special problems in the field of elementary and secondary education. Prerequisite: *consent of the instructor.* First and second semesters. Messrs. Bream, Hayward, Johnston, Peterkin, Teal

Educ. 293-294. Individual Instruction, Field Work, or Research (3)

Open to students with appropriate preparation and needs for pursuing independent investigation. The student must have shown interest in and capacity for advanced work in the chosen field, evidenced in part by an approved plan of work. Prerequisite: *consent of the instructor.* First and second semesters.
Messrs. Bream, Congdon, Hayward, Johnston, Peterkin, Teal, Thomas

Educ. 295-296. Seminar in School Administration (3)

Cooperative study of special problems in the field of school administration. Appropriate problems include: finance, building programs, business management, and school law. Prerequisite: *consent of the instructor.* First and second semesters. Messrs. Bream, Peterkin, Thomas, Watkins

ELECTRICAL ENGINEERING

Professors Bewley, Beaver, and A. R. Miller
Associate Professors Mode and Gruber
Assistant Professors Karakash and Donaldson
Messrs. R. T. Smith, Close, and Dieffenbach

E.E. 23. Thesis for Degree of B.S. in Electrical Engineering (3)

Independent work in theory, experimental research, or designing, with frequent reports of progress, supplemented by reference reading. The subject of the thesis is to be chosen in the first semester, though the work upon which it is based may be done in either semester. Prerequisite: senior standing. First or second semester.

E.E. 24. Summer Work

During the vacation following the junior year each student in electrical engineering is required to spend at least eight weeks getting practical experience in some approved shop or plant. A written report on the shop or plant, and the experience gained therein, is due on or before January 8. These reports should contain such calculations, photographs, drawings, and plots as each individual case may require.

E.E. 32a. Direct Current Machinery (3)

Direct current circuits; magnetic circuits; direct current machine construction, operation, and control; generated voltages, forces on conductors, armature winding, machine characteristics. Prerequisites: *Phys. 24; Math. 13;* Math. 14 concurrently. Second semester.

E.E. 33a. Direct Current Laboratory (1)

A coordinated laboratory course supplementing the classroom work in E.E. 32a. Experimental studies and tests of direct-current machines and appliances, including characteristics, regulations, efficiency, etc. Prerequisite: *E.E. 32a concurrently.* Second semester.

E.E. 34. Alternating Current Circuits (3)

Alternating current conceptions; laws for series and parallel circuits containing R, L, and C; vector methods; complex quantities; single and polyphase circuits and networks; power; Fourier series; harmonics; superposition. Prerequisites: *Math. 14; Phys. 24;* E.E. 32a, or E.E. 60 and 61; *Math. 106 previously or concurrently.* First semester.

E.E. 35. Alternating Current Circuits Laboratory (1)

Supplements E.E. 34. Alternating current circuit experiments, with oscillographic studies. Prerequisite: *E.E. 34 concurrently.* First semester.

E.E. 36. Alternating Current Machines (3)

The electrical, magnetic, and mechanical features of single and polyphase transformers and induction motors. Prerequisites: *E.E. 34,* E.E. 37a concurrently. Second semester.

E.E. 37a. Alternating Current Machine Laboratory (1)

Supplements E.E. 36. Laboratory tests on transformers, transformer banks, and induction motors. Prerequisite: *E.E. 36 concurrently.* Second semester

E.E. 38. Alternating Current Machines (3)

A continuation of E.E. 36. The electrical, magnetic, and mechanical features of synchronous generators, motors, and converters; parallel operation. Prerequisites: *E.E. 36;* E.E. 39 concurrently. First semester.

E.E. 39. Alternating Current Machine Laboratory (2)

A continuation of E.E. 37, supplementing E.E. 38. Laboratory tests on synchronous generators, motors, and converters; measurement of constants, parallel operation, calculations. Prerequisite: *E.E. 38 concurrently.* First semester

E.E. 40. Industrial Electronics (3)

A study of the fundamentals of electronic discharges in vacua and gases; operating characteristics of vacuum and gaseous tubes, mercury arc rectifiers, photoelectric cells, cathode ray oscillographs, industrial electronic control devices, etc. Prerequisite: *E.E. 34 or Phys. 162.* Second semester.

E.E. 60. Electrical Circuits and Apparatus (3)

Theory and applications of direct-current and alternating-current circuits, electronics, and direct-current and alternating-current machines and apparatus. Prerequisites: *Math. 13, Phys. 24.* First or second semester.

E.E. 61. Electrical Problems (1)

A three-hour problem period to accompany E.E. 60. Prerequisite: E.E. 60 concurrently. First or second semester.

E.E. 62. Dynamo Laboratory (1)

Tests on direct-and alternating-current circuits, apparatus and electronic devices. Prerequisite: E.E. 60 concurrently. First or second semester.

For Advanced Undergraduates and Graduates

E.E. 101. Electric Power Stations (3)

Hydro stations; steam stations; prime movers; auxiliary equipment; bus systems; cable; switch gear; circuit breakers; switchboards; measuring and protective devices; layout and design; operation and management; plant economics and rate making; visits to neighboring plants. Prerequisites: *E.E. 38 concurrently.* First semester. Messrs. Beaver, Donaldson

E.E. 102. Distribution Systems (3)

Substations; D.C. and A.C. networks; residential and industrial power distribution; relays; protective devices; short-circuit calculations; economics of distribution. Prerequisite: *E.E. 101.* Second semester.

Messrs. Beaver, Donaldson

E.E. 103. Industrial Applications (3)

Motor characteristics; load characteristics; control devices; conversion apparatus; power factor correction; the principles of motor application, with specific examples; application of electronic devices; electric transportation. Prerequisite: *E.E. 38 concurrently.* First semester.

Messrs. Dieffenbach, Gruber

E.E. 105. Industrial Applications (3)

Continuation of E.E. 103.

E.E. 117. Electrical Engineering Proseminar (1)

A weekly meeting for discussion of topics from the current journals of theoretical and applied electricity. Presentation of papers on assigned topics. Prerequisite: senior standing. Second semester. Mr. Beaver

E.E. 131. Electric and Magnetic Fields (3)

The calculation and construction of electric and magnetic fields for conductors, plates, vacuum tubes, slots, teeth, etc.; analogous problems in fluid flow. The methods of the theory of functions of a complex variable and of Fourier series and integrals are introduced in sufficient detail to serve in the analytical work; the rules for freehand plotting are derived and applied. Prerequisites: *Math. 106;* E.E. 38 concurrently. First semester. Mr. Bewley

E.E. 132. Electric Transients (3)

Electrical, mechanical, and heat flow transients of circuits, transmission lines, electrical machinery, and power systems; operational calculus, to include Fourier integral, Bromwich integral, Laplacian transform, and the direct operational method. Prerequisites: *Math. 106;* E.E. 131. Second semester. Mr. Bewley

E.E. 133. Transmission Lines (3)

Long distance transmission of power; determination of line constants; geometric mean distances; corona; interference; differential equations and solutions; general circuit constants; regulations; losses and efficiency; mechanical design of lines; economics of power transmission. Prerequisites: *Math. 106, E.E. 38 concurrently.* First semester. Mr. Bewley

E.E. 134. Transmission Line Transients (3)

Traveling waves; free and forced oscillations; reflections; transition points; multi-conductor systems; multi-velocity waves; attenuation and distortion; lightning surges; switching surges; arcing grounds; protective devices; surges in transformer and machine windings. Prerequisites: *E.E. 133; E.E. 132 concurrently.* Second semester. Mr. Bewley

E.E. 135. Symmetrical Components (3)

The solution of unbalanced polyphase circuits by means of symmetrical components; system faults, open-circuit and short-circuit current and voltage calculations; sequence impedances of transmission lines, transformer banks, etc.; metering. Prerequisites: *E.E. 38 and 39 concurrently.* First semester. Mr. Miller

E.E. 136. System Stability (3)

Steady state and transient power limits of transmission systems; electromechanical characteristics of electrical machines and networks. Prerequisites: *E.E. 135; E.E. 137 and 138 concurrently.* Second semester. Mr. Miller

E.E. 137. Advanced Machine Theory (3)

The transient theory of A. C. machines; balanced and unbalanced conditions; time constants; approximate and rigorous solutions. Prerequisites: *E.E. 135; E.E. 132 and 138 concurrently.* Second semester. Mr. Miller

E.E. 138. Transients Laboratory (1)

An oscillographic laboratory study of transmission line transients, system stability, and machine transients. Prerequisites: *E.E. 134, 136, and 137 concurrently.* Second semester. Mr. Miller

E.E. 141. Radio Communication (3)

The principles of radio communication; high frequency alternating currents, resonant circuits, and amplifier circuits; laboratory measurements on audio and radio circuits. Prerequisite: *E.E. 40.* First semester. Mr. Mode

E.E. 142. Radio Communication (3)

Continuation of E.E. 141. A study of detection, oscillation, amplitude, and frequency modulation, and television. Prerequisite: *E.E. 141.* Second semester. Mr. Mode

E.E. 143. Wire Communication (3)

Introductory theory of networks; bridge and coupled circuits; impedance matching; telephone circuits; transmission lines at audio and carrier frequencies; communication apparatus. Prerequisite: *E.E. 40.* First semester. Mr. Karakash

E.E. 144. Wire Communication (3)

Continuation of E.E. 143. Wave filters, repeaters, corrective and balancing networks; electro-acoustics; laboratory measurements on wire communication circuits. Prerequisite: *E.E. 143.* Second semester. Mr. Karakash

E.E. 147. Electromagnetic Theory (4)

Vector analysis; divergence, gradient, curl; Stokes' and Gauss' theorems; generalized coordinates; Maxwell's equations; Poynting's theorem; transmission reflection and refraction of waves; retarded potentials; parallel, rectangular, and cylindrical wave guides; radiation from antennae; simple directive arrays; ground reflection. Prerequisites: Math. 106, E.E. 34. First semester. Mr. Mode

For Graduates

Graduate students intending to major in electrical engineering must have completed a program of study equivalent to that required for the B.S. in E.E. at Lehigh University.

With proper approval, Phys. 220 and 221, Theoretical Physics, may be included in a graduate major in electrical engineering.

Graduate courses are given to qualified men from the industries of the surrounding district.

E.E. 203. Electrical Design (3)

Predetermination by calculation of the characteristics, regulation, and performance of electrical machinery; analysis and use of design constants; design of special machines. First semester. Mr. Beaver

E.E. 204. Electrical Design (3)

Continuation of E.E. 203. Second semester. Mr. Beaver

E.E. 209. Advanced Radio and Electronics (3)

A course covering selected radio theory throughout the entire frequency spectrum; antennae radiation patterns; microwave circuits and circuit elements; selective networks at ultra-high frequency; wide band amplifiers; electronic servo-feedback system; electro-acoustics. First semester. Mr. Mode

E.E. 210. Advanced Radio and Electronics (3)

Continuation of E.E. 209. Second semester. Mr. Mode

E.E. 211. Advanced A.C. Machine Theory (3)

The two-reaction theory of synchronous machines in the steady and transient states; harmonic analysis; field and armature time constants; direct and quadrature synchronous, transient, and sub-transient reactances; electrical and mechanical transients of electrical machines, both singly and in conjunction with external circuits; calculation of voltage, current, mechanical oscillations, and hunting, forces and torques; operation of machines under unbalanced conditions and faults; effect of variable excitation. Two lectures and one laboratory period per week. First semester. Given in alternate years. Mr. Miller

E.E. 212. Advanced A.C. Machine Theory (3)

Continuation of E.E. 201. Second semester. Mr. Miller

E.E. 213. Power System Stability (3)

Power flow in electric circuits; steady state power limits of systems having synchronous and asynchronous machines with salient poles or round rotors; stability criteria; and other related topics. First semester. Given in alternate years. Mr. Miller

E.E. 214. Power System Stability (3)

Continuation of E.E. 213. Transient stability problems, including machine inertias, governor action, unbalanced system conditions, various excitation systems and exciter transient effects, and switching operation. Second semester. Mr. Miller

E.E. 217. The Economics of Electric Power (3)

A treatment of economic principles as applied to the design, selection, and use of electrical apparatus, plants, and systems; the adjustment of fixed charges and operating expenses by the application of Kelvin's law to problems of generation, transmission, conversion, distribution, and utilization of electric power. First semester. Mr. Beaver

E.E. 218. The Economics of Electric Power (3)

Continuation of E.E. 217. Second semester. Mr. Beaver

E.E. 219. Theory of Networks (3)

Consideration of electrical networks from the general standpoint. Characteristics of two- and four-terminal networks; Foster's, Cauer's, and Bartlett's theorems; transformation by matrix manipulation; theory of long lines. First semester. Mr. Karakash

E.E. 220. Theory of Networks (3)

Continuation of E.E. 219. Advanced theory of wave filters; simulative and corrective networks; transient behavior of long lines and filters. Second semester. Mr. Karakash

E.E. 223. Tensor Analysis of Electric Circuits and Machines (3)

The application of dyadics, matrices, and tensors to the theory of electric circuits and machinery; static networks, network theorems, vacuum tube circuits, transformers, and transmission lines. First semester. Mr. Bewley

E.E. 224. Tensor Analysis of Electric Circuits and Machines (3)

Continuation of E.E. 223. The generalized machine; equations of motion, voltage, torque, small oscillations and power for holonomic, nonholonomic and quasi-holonomic reference systems; applications to all machines constituting special cases of the generalized machine; the equations of Lagrange, Maxwell, and Maxwell-Lorentz are used as starting points in the general theory. Second semester. Mr. Bewley

ENGLISH

Professors R. M. Smith and Severs
Associate Professors Riley, Strauch, Christensen, S. B. Ewing, and Quinlan
Assistant Professors Rights, Armstrong, and Everitt
Messrs. Hertz, Kenyon, Criswell, J. R. Moore, Newton, Graber,
W. B. White, Hartung, Nead, and DeVinney

FRESHMAN COMPOSITION

All students are required to complete successfully courses in freshman composition carrying a total of six credit hours toward graduation.

On the basis of their performance in preliminary tests given during freshman week, first semester freshmen are assigned to one of three courses designed to meet their particular needs. Engl. 1 is taken by all whose preparation appears to have been adequate but who do not give evidence of outstanding ability. Superior students take Engl. 3a. Those who do poorly in the preliminary tests are required to take Engl. 0. Engl. 1 normally is followed by Engl. 2, and Engl. 3a by Engl. 3b in the second semester, while students who take and pass Engl. 0 in the first semester enroll in Engl. 1 in the second. A student whose classwork shows that he has been placed in the wrong group may be transferred to a higher or lower group at any time during the year, if his instructor recommends and the head of the department approves the transfer.

Since Engl. 0 carries no credit toward graduation, students assigned to this course in their first semester are required to continue the study of freshman composition beyond the freshman year until the minimum requirement of six semester hours has been met.

Engl. 0. Elementary Composition (0)

Drill in the fundamentals of English grammar and in the mechanics of writing. First and second semesters.

Engl. 1. Composition and Literature (3)

A rapid review of functional grammar and of sentence and paragraph structure; practice in outlining and original composition; readings in expository prose. First and second semesters.

Engl. 2. Composition and Literature (3)

Continuation of Engl. 1. Practice in expository writing, including documental papers and reports; readings in types of literature. First and second semesters.

Engl. 3a. Types of World Literature (3)

A course in composition and literature for superior students who do not need the basic training of English 1 and 2. In addition to wide and thoughtful reading in world masterpieces the course requires correct and effective writing of critical essays, original sketches, and documented research papers. First semester.

Engl. 3b. Types of World Literature (3)

Continuation of Engl. 3a. Second semester.

ENGLISH LITERATURE AND COMPOSITION

Students wishing to major in English literature should take as preliminary work either Engl. 3a, 3b, or 4, 5, or 8, 9, or such equivalent courses as may be recommended by the head of the department. They should then elect two English courses in each semester of the junior year and at least two in each semester of the senior year. Students working for honors take a seminar course in which they prepare a thesis as part of the honors requirement.

Engl. 4. A Study of the Drama (3)

Reading and critical study of types of drama; theories of the drama; the drama and the stage; the drama as a criticism of life. Prerequisites: Engl. 1 and 2. First semester.

Engl. 5. A Study of the Drama (3)

Continuation of Engl. 4. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 7. A Study of the Short Story (3)

A critical study of the short story, English, American, and Continental. Class discussions, extensive collateral reading, and reports. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 8. English Literature (3)

A survey of English literature from *Beowulf* through the Pre-Romantics, with selected readings. Prerequisites: Engl. 1 and 2. First semester.

Engl. 9. English Literature (3)

A survey of English literature from Wordsworth to Housman. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 18. The Novel (3)

A study of the types of the novel. Reading and reports; lectures on the history of the novel in England and America. Prerequisites: Engl. 1 and 2. First semester.

Engl. 19. The Novel (3)

Continuation of Engl. 18. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 20. American Literature, 1607-1855 (3)

A survey of the major writers from the settlement of America to the Civil War. Lectures and class discussions. Prerequisites: Engl. 1 and 2. First semester.

Engl. 21. Modern American Literature (3)

A study of the development of American literature from Whitman to the present day. Lectures and class discussions. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 35. Types of Poetry (3)

A course in the reading of poetry, proceeding from simple verses to difficult, to provide a thorough acquaintance with the idioms of poetry so that it may be read not as a translation of a foreign language but as an intelligible and highly expressive use of our own. Prerequisites: Engl. 1 and 2. Second semester.

Engl. 36. Masterpieces of World Literature (3)

A study of great works selected from the literature of epic poetry, the drama, the romance, philosophy, and the essay to illustrate the humanistic traditions of Western civilization. Not open to students who have taken Engl. 3a or 3b. Prerequisites: Engl. 1 and 2. First semester.

Engl. 41. Business Letters (3)

Rhetorical and psychological principles and forms in modern business communication; practice in writing letters of inquiry, request, reply, acknowledgment, adjustment, credit, collection, sales, and application. Prerequisites: Engl. 1 and 2. First and second semesters.

Engl. 42. Technical Writing (3)

Study and practice in forms and methods of technical exposition, description, definition, classification; the technical report, abstract, editorial, and book review; the semipopular article. Prerequisites: Engl. 1 and 2. First or second semester.

Engl. 81. Undergraduate Thesis (3)

Open to advanced undergraduates who wish to submit theses in English. First semester.

Engl. 82. Undergraduate Thesis (3)

Continuation of Engl. 81. Second semester.

Engl. 83. Readings in English Literature (3)

Open to advanced students who wish to pursue special courses of reading in English literature. First semester.

Engl. 84. Readings in English Literature (3)

Continuation of Engl. 83. Second semester.

For Advanced Undergraduates and Graduates

Engl. 117. The Modern Play and Playwright (3)

Readings and discussion of the foremost American dramas and dramatists of stage, screen, and air. Some of the important playwrights represented are Maxwell Anderson, Robert Sherwood, Lillian Hellman, Norman Corwin, and Arch Oboler. Mr. Christensen

Engl. 118. American Literature (3)

Movements that have shaped American thought and feeling as expressed in the national literature: Puritanism, Americanism, Romanticism, Transcendentalism, Individualism, the Civil War, Democracy, the West, Realism, Internationalism, and Skeptism, as presented by Jonathan Edwards, Franklin, Paine, Longfellow, Poe, Emerson, Thoreau, Mark Twain, Henry James, and Henry Adams. Summer session. Mr. Strauch

Engl. 120. The Novel (3)

The great masterpieces of prose fiction produced in England, in America, and on the Continent during the nineteenth and twentieth centuries. Development of types of the novel. The theory and technique of the novel. Summer session. Mr. Riley

Engl. 121. Contemporary Literature (3)

Present-day American literature. Collateral readings and reports. Prerequisites: six hours chosen from Engl. 3a, 3b; 4, 5, 7; 8, 9; 18, 19; 20, 21, or from any of the courses in the 100 or 200 group. First semester. Messrs. Riley, Strauch

Engl. 122. Contemporary Literature (3)

Present-day English and European literature. Collateral readings and reports. Prerequisites: same as for Engl. 121. Second semester . Messrs. Riley, Strauch

Engl. 123. Shakespeare and the Elizabethan Drama (3)

The development of the English drama, including the important plays of Shakespeare. First semester. Mr. Smith

Engl. 124. Shakespeare and the Elizabethan Drama (3)

Continuation of Engl. 123. Second semester. Mr. Smith

Engl. 125. English Literature of the Romantic Era (3)

Poetry and prose of the chief romantic writers—Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, Landor, Lamb, Hazlitt—with consideration of the political, religious, and social problems of the period as they are exhibited in the literature. Readings and class discussions. First semester. Mr. Severs

Engl. 126. English Literature of the Victorian Era (3)

Poetry and prose of the chief Victorian writers—Tennyson, Browning, Arnold, Clough, Rossetti, Morris, Swinburne, Macaulay, Carlyle, Mill, Newman, Ruskin—with consideration of the political, religious, and social problems of the period as they are exhibited in the literature. Readings and class discussions. Second semester. Mr. Severs

Engl. 131. Milton (3)

The life and works of John Milton in connection with the history of his times and the chief sources of his inspiration. First or second semester. Mr. Riley

Engl. 133. Restoration and Augustan Literature (3)

Prose and poetry from 1660 to 1745 with special emphasis upon the works of Dryden, Pope, and Swift, and some consideration of the influential ideas of Hobbes, Locke, Berkeley, and Hume. First semester.
Mr. Quinlan

Engl. 134. Age of Johnson (3)

English prose and poetry from 1745 to 1798; Dr. Johnson and his circle, and the Pre-Romantics, including Burns and Blake. Second semester.
Mr. Quinlan

Engl. 135. History of the English Language (3)

A survey of the development of the English language, in vocabulary, pronunciation, and structure, beginning with its relation to the other Germanic languages and coming down to modern English usage. First or second semester Mr. Ewing

Engl. 136. Writing for Publication (3)

Comprehensive study of the short-story and practice in the various techniques of writing short-stories, essays, and poems with a view to publication. Prerequisites: junior standing or consent of the head of the department. First or second semester. Mr. Criswell

Engl. 137. The Renaissance (3)

The growth of English non-dramatic literature in the sixteenth century and the stimulus in the Italian Renaissance and northern humanism. Readings in and class discussions of the works of the chief writers—Petrarch, Erasmus, More, Wyatt, Surrey, Lyly, Sidney, and Spenser. First semester.
Mr. Ewing

Engl. 138. The Seventeenth Century (3)

Continuation of Engl. 137. The rich variety of English literature from Donne to Dryden—Donne and the "Metaphysical School"; Jonson and "The Tribe of Ben"; Cavalier and religious poetry; the prose of Bacon, Brown, Burton, Walter, and Bunyon. Second semester. Mr. Christensen

Engl. 141. Biographies of Great Men (3)

A comparative study of biographical writing as illustrated by famous lives of great men in literature and history. Attention will be given to the development of biography and to the various theories and schools of biographical writing. (Not offered 1949-1950.)

For Graduates

Candidates for the master's degree majoring in English literature may qualify for the degree under either of two plans offered by the department. Under Plan I the candidate is required to complete successfully eight semester courses (twenty-four hours) and to write a thesis representing the equivalent of six hours of course work, but he is not required to take an examination covering the entire field. Under Plan II no thesis is required; but the student, in addition to completing successfully ten semester courses (thirty semester hours), must pass an examination, usually oral, covering the entire field of English literature. The candidate selects the plan better suited to his needs and abilities, upon the advice and with the approval of the head of the department.

If his needs and interests make it desirable for him to do so, the candidate for the master's degree is permitted to take collateral work in other departments to the extent of six semester hours in lieu of an equivalent amount in the major field.

Candidates for the doctor's degree are expected to master the subject matter of the entire field of English and American literature. Other requirements for the doctorate will be found on pages 127 to 130.

Students desiring to qualify for graduate degrees in this department should have taken as part of their undergraduate work at least twelve semester hours of advanced courses in English literature. Those with undergraduate deficiencies who are admitted because otherwise well qualified will be expected to make up such deficiencies in addition to satisfying the minimum requirements for the degree sought.

Engl. 220. Graduate Seminar (3)

An intensive study of the works of an English author or a type of literature. Summer session. Messrs. Riley, Severs, Smith

Engl. 221. Graduate Seminar (3)

Research and reports First semester. Mr. Smith

Engl. 222. Graduate Seminar (3)

Continuation of Engl. 221. Second semester. Mr. Smith

Engl. 227. Old English (3)

A study of the Old English language and literature. First or second semester. Mr. Riley

Engl. 229. Literary Criticism (3)

A course aimed to correlate and unify the student's previous work in literature by means of wide reading in critical literature and discussions of theories and schools of criticism. First semester. Mr. Smith

Engl. 230. Literary Criticism (3)

Continuation of Engl. 229. Second semester. Mr. Smith

Engl. 231. Graduate Thesis (3)

First semester. Mr. Smith

Engl. 232. Graduate Thesis (3)

Second semester. Mr. Smith

Engl. 233. Literature of the Fourteenth Century (3)

Types of medieval literature with special attention to Langland, Gower, Chaucer. (Not offered 1949-1950.) Mr. Severs

Engl. 234. Chaucer (3)

A study of the life and works of Chaucer, with some attention to his chief contemporaries. Readings, reports, and class discussions. First semester. Mr. Severs

Engl. 235. Chaucer (3)

Continuation of Engl. 234. Second semester. Mr. Severs

Engl. 236. Bibliography and Methods of Research (3)

A study of the bibliographical tools essential to an advanced student of English literature. Survey of historical, or critical, bibliography, of both printed books and manuscripts; of practical bibliography, including direction in the compilation of a list of books and articles on an assigned subject and in the procedures of thesis writing; and of enumerative bibliography, including an introduction to the chief printed bibliographies of the English language and literature. First semester. Mr. Severs

SPEECH

Associate Professor H. B. Davis
Assistant Professor Rights
Messrs. Benner, Ritze, and Hopkins

Speech Clinic

For the purpose of diagnosis and treatment of speech defects. Individual instruction provided for students with minor disturbances of voice and speech, as well as those with more serious handicaps. Open to all students in need of corrective treatment and to those desiring speech tests. By appointment. No credit.

Speech 30. Fundamentals of Speech (3)

A foundation course designed to develop knowledge of the basic principles of speech and ability to speak effectively on the platform. Prerequisites: Engl. 1 and 2. First and second semesters.

Speech 31. Business Speaking (3)

Principles of individual problem-solving and group policy-deliberation; practice in the conduct of personal interviews and conferences; delivery of reports, instructions, and explanations; sales, inspirational, and good-will talks; after-dinner speeches; speeches of courtesy; telephone speaking. Prerequisite: Speech 30. First and second semesters.

Speech 32. Discussion and Argument (3)

The technique of investigation, analysis, evidence, inference, brief-making, and refutation in oral argument; participation in the various forms of discussion—conference table, panel, and symposium—and in various types of debate—conventional, cross-examination, and direct clash. Students are urged to participate actively in the Debate Society of the University. Prerequisite: Speech 30. Second semester.

Speech 33. Parliamentary Procedure (1)

Study and drill in modern rules and methods of conducting organized group-deliberation. Prerequisite: *consent of the head of the department.* First semester. (Not offered 1949-1950.)

Speech 51. Radio Workshop (3)

A practical course in the organization and production of radio programs, development of radio voice, and radio techniques, with emphasis on the use of radio in the fields of journalism, advertising, business, and dramatics; practical experience over local radio station. Prerequisite: *consent of the head of the department.* First semester.

Speech 52. Radio Workshop (3)

Continuation of Speech 51. Second semester.

Speech 61. Dramatics (3)

The practical technique and production of plays; acting, stage-lighting, scenic design and execution, and student direction of plays. Each member must write either an original one-act play or a thesis upon any practical problem of the modern theater. One play is presented each semester.

Speech 62. Dramatics (3)

Continuation of Speech 61.

For Advanced Undergraduates and Graduates

Speech 151. Radio Workshop (3)

A practical course in the organization and production of radio programs, development of radio voice, and radio techniques. Particular attention will be given to the difficulties encountered by those who teach radio or have to produce school programs. Practical experience over local radio station. Prerequisite: *consent of the head of the department.* Summer session.

Mr. Davis

Speech 160. Speech for the Teacher (3)

An orientation course in the field of speech for those engaged in classroom teaching or in directing extra-curricular speech activities. Discussion as a teaching device; integration of speech with other subjects; recognition of common defects of speech; modern emphases in speech contests; individual investigations, report, and conferences. Summer session.

Mr. Davis

Speech 161. Dramatics (3)

A practical course in the production of plays; problems of designing of scenic effects, directing, and acting. Particular attention will be given to the difficulties encountered by those who teach dramatics. A production will be given by the class. Summer session. Mr. Davis

JOURNALISM

Assistant Professor Wynn
Mr. McFadden

Students majoring in journalism take Journ. 11, 12, 13, 15, 16, 18, and 20. They must also register for and complete at least four credits in Journ. 1-8, taking it each semester after declaring their major.

At least twenty-four credits of advanced journalism courses (above Journ. 1-8, Brown and White) and a minimum of thirty credits, including Brown and White, are required for graduation. Other requirements include twelve hours to be chosen from the following courses: Engl. 4, 5, 7, 8, 9, 20, 21, 123, 124, or such equivalents as may be allowed; Hist. 25, 26, or 129, 130; Govt. 51, 52; Eco. 3, 4; Soc. 51, 161, 162; and one of the following: Govt. 157, Eco. 11, 113, 133, 134.

In choosing electives, the journalism major is advised to take one or more of such special sequences as: journalism and radio; journalism, business and technical; journalism and government.

The comprehensive examination in journalism includes the contents of courses studied in the sophomore, junior, and senior years.

Journ. 1-8. Brown and White (1)

Enrollment constitutes membership on the staff of the semi-weekly paper. The student elects either editorial or business subdivision, and wins promotion on a merit system. All composition work is for publication. Only students who have completed six semesters of Brown and White are eligible for the top executive posts. Students enrolling for their first semester sign for Journ. 1; for their second semester, Journ. 2; etc. By faculty action this course may be elected each semester for credit in addition to other courses on a student's roster. First and second semesters.

Journ. 11. Newspaper Reporting and Writing (3)

A basic course in newspaper reporting. Definition of news; news values and reader interest; structure of the news story; newspaper English; practice in reporting and writing news features. Prerequisites: Engl. 1 and 2. First semester.

Journ. 12. Advanced Newspaper Reporting and Writing (3)

Continuation of Journ. 11. A course in the reporting and writing of selected types of news, including sports, politics, courts, travel, industrial news, and dramatics. Second semester.

Journ. 13. Newspaper Editing and Copy Reading (3)

Study and practice of newspaper desk work; headline writing, makeup, and typography; selecting, editing and rewriting news and feature copy; use of reference works and morgue. Prerequisites: Journ. 11. First semester.

Journ. 14. Press Photography (3)

A study of the fundamentals of news and feature photography; practice in planning and taking pictures, in developing pictures, and in making suitable enlargements for publication; lecture-demonstrations and laboratory assignments in the use of cameras, lights, filters, special lenses, and enlargers. Second semester.

Journ. 15. Editorial Writing (3)

The content and technique of the editorial; the writing of newspaper and magazine editorials; dramatic and book reviews; and other types of critical writing. First semester.

Journ. 16. Newspaper Problems and Policies (3)

Libel, privacy, rights and privileges of the press, ethics, postal regulations, copyright, and crusades; dealing with pressure groups. Second semester.

Journ. 17. Writing Special Feature Articles (3)

Writing feature articles from newspaper "brighteners" to magazine articles. Students are required to slant their articles for magazines and newspapers which buy free-lance. First semester.

Journ. 18. History of American Journalism (3)

English background of the American newspaper; development of press from Colonial days to the present; influence of newspaper on American life; contributions of outstanding journalists. Prerequisite: junior standing. Second semester.

Journ. 20. Journalism Proseminar (3)

Required of students of senior standing who are majoring in journalism. Survey of the newspaper field in its relation to public affairs. Extensive reading in books, magazines, and newspapers. Second semester.

Journ. 21. Creative Writing (3)

The study and writing of essays and short-stories (and verse, if requested), with a view to developing each student's particular talent. Prerequisites: Engl. 1 and 2. First semester.

Journ. 22. Creative Writing (3)

Continuation of Journ. 21. Prerequisites: Engl. 1 and 2. Second semester

Journ. 23. Editing the House Organ and Trade Publication (1)

A course in selecting copy, in planning layouts, and in handling elementary problems of editing trade magazines. Prerequisites: *Engl. 1 and 2, and junior standing.* First semester.

Journ. 25. Radio News Writing (1)

Preparation of news and feature copy for radio news casting; practice on both local and press association copy. Normally given in conjunction with Speech 51, Radio Workshop. Lecture-recitation and supervised laboratory instruction. Prerequisites: *Journ. 1; Engl. 1 and 2.* First semester.

Journ. 26. Radio News Writing (1)

A continuation of Journ. 25. Second semester.

Journ. 31. Community Journalism (3)

An elective for students interested in the small-town weekly field. A study of ethical and legal problems, community news sources, business and promotional problems. Careful examination of community papers which lead in local news coverage, classified advertising, photography, circulation, community service, and local advertising. Laboratory work on community newspapers in this region. First semester.

Journ. 32. Community Journalism (3)

Continuation of Journ. 31. Second semester.

Journ. 43. Writing for Business (3)

Study of and practice in writing business news stories and reports which the business man must prepare; the employee magazine. Prerequisites: Engl. 1 and 2. First and second semesters.

For Advanced Undergraduates and Graduates

Journ. 101. Modern Newspaper Practice (3)

A course in methods of securing, writing, and editing news. Evaluation and organization of news; study of news sources and values and reader interest; difficulties encountered by faculty advisers of secondary school publications; individual conferences with such advisers. Summer session.
Mr. Wynn

FINANCE

Professor Bradford
Associate Professor Hotchkiss
Messrs. Brazer and Perry

Fin. 25. Principles of Corporation Finance (3)

An intensive course covering the fundamentals of corporation finance in one semester. Prerequisite: *Eco. 3.* First and second semesters.

Fin. 26. Problems in Corporation Finance (3)

Continuation of Fin. 25. Prerequisite: Fin. 25.

Fin. 29. Money and Banking (3)

A general course dealing with the nature and functions of money and commercial banking, monetary and banking development in the United States, the banking process, banking problems, the value of money, international exchange, and monetary and credit policies. Prerequisite: *Eco. 4.* First semester.

Fin. 30. Money and Banking (3)

Continuation of Fin. 29. Prerequisites: *Eco. 4;* Fin. 29. Second semester.

Fin. 33. Money and Banking (3)

The nature of money and commercial banking, the banking process in the United States, current banking problems, the value of money, and credit policy. Prerequisite: *Eco. 4.* First and second semesters.

Fin. 41. International Trade and Finance (3)

Economic, commercial, and financial relations of nations, including economic organizations, basic principles and practices of international trade, finance, and investment. Prerequisites: *Eco. 3, 4.* First semester.

Fin. 42. International Trade and Finance (3)

Continuation of Fin. 41. Prerequisite: Fin. 41. Second semester.

For Advanced Undergraduates and Graduates

Fin. 123. Investments (3)

A study, from the standpoint of the investor, of the various types of corporation and government securities, with special reference to owners' equities, comparative yields, and the machinery of investment, including stock exchange operations. Prerequisite: *Fin. 22 or 25.* First semester.
Mr. Hotchkiss

Fin. 124. Investments (3)

A project course in investment analysis for advanced students who are already familiar with investment principles. Sources of data and analysis procedures; the securities of industrials, railroads, public utilities, and municipalities. Prerequisites: *Fin. 123 and consent of the head of the department.* Second semester.
Mr. Hotchkiss

Fin. 127. Public Finance (3)

A course dealing with government expenditures and revenues, the economics of taxation, and government administration. Prerequisites: *Eco. 4;* Fin. 30. First semester.
Mr. Brazer

Fin. 128. Fiscal Policy (3)

History and nature of fiscal policy, public debt, national income, full employment proposals and programs. Prerequisite: Fin. 127. Second semester.
Mr.. Brazer

Fin. 131. Bank Credit Problems (3)

A course dealing with the problems surrounding the extension of loans to customers and the purchase of open market paper by the individual banker. Legal regulations and restrictions, the instruments of bank credit extension, and the analysis of the bank borrower's credit position will be treated in detail. Prerequisites: *Fin. 29, 30.* First semester. Mr. Bradford

Fin. 132. Monetary and Credit Policies (3)

A course devoted to the study of monetary and credit policies of governments and central banks, with special reference to the policies of the United States and the Federal Reserve System in these directions. Theoretical possibilities of credit control will be considered and compared with control policies which are being practiced or have been resorted to by the authorities in the past. Prerequisites: *Fin. 29, 30.* Second semester. Mr. Bradford

Fin. 135. Transportation (3)

To be offered by the Department of Economics after 1948-1949. For a description see Eco. 135.

Fin. 136. Public Utilities (3)

To be offered by the Department of Economics after 1948-1949. For a description see Eco. 136.

Fin. 171. Readings in Finance (3)

A course of readings in various fields of finance, designed for the student who has a special interest in some field of finance not covered by the regularly rostered courses. Prerequisites: senior standing and consent of the head of the department. First semester. Mr. Bradford

Fin. 172. Readings in Finance (3)

Continuation of Fin. 171. Prerequisites: senior standing and consent of the head of the department. Second semester. Mr. Bradford

FINE ARTS

Professor Howland
Messrs. Knight and Regan

F.A. 3. History of Architecture (3)

The development of architecture from Egypt and Mesopotamia, through Greece and Rome, the early Christian and romanesque periods to the rise of gothic. First semester.

F.A. 4. History of Architecture (3)

Continuation of F.A. 3. The spread of gothic architecture, the incoming of the Renaissance, followed by a discussion of succeeding styles, classicism, romanticism, functionalism, the international style, and current movements. Second semester.

F.A. 5. Freehand Drawing (3)

Elementary freehand perspective, with drawing from nature, still life, and casts in pencil and charcoal, in the various modes: delineation, form-drawing, color value. First semester.

F.A. 6. Freehand Drawing (3)

Further practice in expression; color theory with exercises in water colors or oils, if desired. Second semester.

F.A. 11. Ancient and Medieval Art (3)

An approach to the understanding and enjoyment of the arts: development of art through the ancient and medieval periods; relation between artistic expression and the age which produced it. Lectures. Open to freshmen. First semester.

F.A. 12. The Art of the Italian Renaissance (3)

Painting, sculpture and architecture are examined as the outgrowth of conditions in Italy during the fourteenth, fifteenth, and sixteenth centuries: the influence of medieval thought and tradition, the awakening interest in nature, the effect of antiquity, especially the stimulus it gave to individual effort. Lectures. Open to freshmen. Second semester.

F.A. 13. The Art of the Northern Renaissance (3)

Art in Europe other than Italy from the fifteenth century to the French revolution; contrasts between native tendencies and foreign influences, especially those of the Italian renaissance, with the resulting struggle between idealism and realism. Lectures. Prerequisite: F.A. 12. First semester.

F.A. 14. Modern Art (3)

The nineteenth and twentieth centuries; historical relationships, underlying theories, and influence of contemporary thought as aids in understanding modern art. The discussions include classicism, romanticism, impressionism, and the various modern schools. Prerequisite: F. A. 11 or 12. Second semester.

F.A. 17. Criticism and Analysis of Art (3)

A critical analysis of the divergent views of the nature of art, its origin and intention. The ancient writers are consulted for views held in Greece and Rome. Factors in molding art opinion in the middle ages; changes in the renaissance. Primarily for majors. Prerequisites: F.A. 11 and 12, or suitable preparation in the history of fine arts, and consent of the head of the department. First semester.

F.A. 18. Criticism and Analysis of Art (3)

Continuation of F.A. 17 with special attention to art criticism since the 17th century. Prerequisite: same as for F.A. 17. Second semester.

F.A. 25. Principles and Practices of Painting (3)

The principles and technique of oil painting. The greater portion of the time is devoted to actual painting from nature. Occasional lectures, illustrated by lantern slides and color reproduction, on composition, technique, color, light, plastic, and special effects, and mood. Primarily for students in the Adult Education Program. Prerequisite: F.A. 5 or 6, or consent of the instructor.

F.A. 26. Creative Painting (3)

The course aims to develop the imaginative and creative powers of the student. Special attention is given to problems of composition. Prerequisites: F.A. 5 or 6, or consent of the instructor.

FRENCH

See Romance Languages

GEOLOGY

Professor Willard
Associate Professors Whitcomb and Gault
Assistant Professors Weitz and G. R. Jenkins
Messrs. Stevenson, Tooker, Mills, Taylor, Bergenback, and MacFadyan

Geol. 1. Principles of Geology (3)

An introductory survey of geologic processes. Lectures; laboratory exercises on common minerals, rocks, ores, and fossils; study of topographic maps. First and second semesters.

Geol. 3. Fundamentals of Geology (3)

The origin, history, and economic significance of topographic features, soils, and natural resources; interpretation and construction of topographic maps. Lectures, laboratory, and occasional field trips. First semester.

Geol. 4. Fundamentals of Geology (3)

Continuation of Geol. 3. Meteorology, climatology, oceanography, and geographical location; factors constituting the natural environment in their effect upon man. Lectures, laboratory, and occasional field trips (bus fare about $3.75). Prerequisite: *Geol. 3.* Second semester.

Geol. 6. Engineering Geology (4)

Designed primarily for engineering students. Basic geologic principles; selected minerals, rocks, building materials, geologic structures; applications of geology to such problems as dam sites, tunnels, foundations, highways, underground water, and flood control. Three lectures and one laboratory period per week. Second semester.

Geol. 12. Historical Geology (3)

The development of the continents and life forms; evolution based on the remains of animal and plant life preserved in the rocks. Lectures, laboratory, and field trips. Prerequisites: *Geol. 1, or 3 and 4.* Second semester.

Geol. 31. Mineralogy (3)

The principles of crystallography, with practice in determination of forms of models and crystals; the physical properties, origin, occurrence, association, and alteration of minerals; a study of common mineral species and varieties, with practice in identification based on physical properties. Prerequisite: *Chem. 4 or its equivalent.* First semester.

Geol. 32. Petrology (3)

Microscopic study of igneous, sedimentary, and metamorphic rocks; their origin, classification, and identification. Prerequisite: *Geol. 31.* Second semester.

Geol. 33. Blowpipe Analysis (1)

The principles of blowpipe analysis of minerals and an introduction to chemical mineralogy, with practice in identification of minerals through chemical methods. To be taken concurrently with Geol. 31, Mineralogy. Prerequisite: *Chem. 4 or its equivalent.* First semester.

Geol. 35. Engineering Mineralogy (2)

Elementary crystallography and the occurrence and properties of the common minerals; elements of crystal structure; physical and chemical properties of crystals. Planned for the metallurgical engineering curriculum and for students in chemistry and physics. Prerequisite: *Chem. 4 or its equivalent.* First semester.

For Advanced Undergraduates and Graduates

Geol. 111. Paleontology (3)

Plant and animal fossils from the morphologic point of view; their use in interpreting geologic history; evolution of the faunas and floras. Lectures and laboratory work. Prerequisites: Geol. 1, or 3 and 4, 12; or Biol. 1, or 31 and 32. First semester. Mr. Whitcomb

Geol. 112. Stratigraphy and Sedimentation (3)

The origin, history, sequence, and correlation of bedded rocks; their faunas, ages, distribution, and structures. Lectures, laboratory, and field trips. Prerequisites: *Geol. 12;* Geol. 32, 111. Second semester. Mr. Willard

Geol. 121. Structural Geology (3)

The major and minor structures encountered in both the massive and the layered rocks of the earth's crust. Problems of the type encountered in geological, geophysical, and mining work are studied in the laboratory and on field trips. Prerequisites: *Geol. 12, 32.* First semester. Mr. Weitz

Geol. 131. Optical Crystallography (3)

The polarizing microscope and its application in the examination and identification of minerals by the immersion method and in thin section. Prerequisites: *Geol. 1, 32.* First semester. Mr. Gault

Geol. 132. Petrography (3)

Microscopic studies of igneous, sedimentary, and metamorphic rocks in thin section. Prerequisite: *Geol. 131.* Second semester. Mr. Gault

Geol. 141. Field Geology (3)

Practice in mapping and field work. Each student is assigned a field problem and is required to prepare a report thereon with geologic map, structure section, and collection of a full set of specimens. Prerequisites: *Geol. 12, 32, 112, 121.* First semester. Mr. Willard

Geol. 142. Field Trip (1)

The spring field trip, of several days' duration, is held after mid-semester. The first part of the semester is devoted to literature, reports, and discussions germane to the announced trip. A written summary of the excursion is required of each participant. Offered primarily for geology and conservation majors. Second semester, alternate years with Geol. 144. (Offered 1950-1951.)

Geol. 143. Cartography (1)

The making and interpretation of maps; photogrammetry and the use of the stereoscope. Prerequisite: geology or conservation major. First semester. Messrs. Gault, Whitcomb

Geol. 144. Field Trip (1)

Similar to Geol. 142, but arranged to visit a different region. Prerequisite: geology or conservation major. Second semester, alternate years with Geol. 142. (Offered 1949-1950.)

Geol. 151. Mineral Resources (3)

Discussion of world mineral resources, their distribution, occurrence, abundance, reserve supplies; strategic minerals. Lectures, laboratory, and field trips. Prerequisites: *Geol. 12, 32;* Geol. 112, 121. First semester. Mr. Weitz

Geol. 152. Mineral Resources (3)

Continuation of Geol. 151. Prerequisite: *Geol. 151.* Second semester. Mr. Weitz

Geol. 161. Earth Science Applied to Conservation (3)

The application of geology to problems of conservation: conservation and exploitation of strategic minerals; weathering, erosion and transportation; origin and types of soil, soil erosion and its control, soil conservation; climatic factors, water supply, flood control. Lectures, laboratory, and field trips. Prerequisites: *Geol. 12, 32;* Geol. 171, 172. First semester. Mr. Jenkins

Geol. 162. Earth Science Applied to Conservation (3)

Continuation of Geol. 161. Prerequisite: *Geol. 161.* Second semester.
Mr. Jenkins

Geol. 171. Meteorology (3)

Principles of meteorology, composition of the atmosphere, physics of the air, weather phenomena, air masses and fronts, wind systems, cyclones and anticyclones, weather instruments and forecasting. First semester.
Mr. Jenkins

Geol. 172. Climatology (3)

Climatologic observations, climatic statistics and problems, world climate types; application of climatology to man's needs and activities. Second semester. Prerequisite: *Geol. 171.* Mr. Jenkins

Geol. 181. Geological Problems (1-4)

Special problems in field, laboratory, and library. Specific work is assigned in individual cases. Prerequisite: completion of substantially all other "100" courses in geology. Prospective students for this course should consult the department head. First semester.
Messrs. Gault, Jenkins, Weitz, Whitcomb, Willard

Geol. 182. Geological Problems (1-4)

Similar to Geol. 181. Geol. 182 may be elected as a continuation of Geol. 181 or separately. Prerequisites as for Geol. 181. Prospective students should consult the department head. Second semester.
Messrs. Gault, Jenkins, Weitz, Whitcomb, Willard

For Graduates

Geol. 202. Advanced Physiography (3)

Detailed study of physiographic types and processes. Conferences, reports, and thesis, with work in the laboratory and field. Second semester. (Offered 1949-1950.) Mr. Whitcomb

Geol. 211. Advanced Paleontology (3)

Detailed study of selected groups of fossils: generic and specific differences, identifications, descriptions; preparation of fossils. First semester. (Offered 1950-1951.) Messrs. Whitcomb, Willard

Geol. 212. North American Index Fossils (2)

Study of a limited series of representative North American index fossils, their distinguishing characters, geographic distributions, geologic ranges. Laboratory work supplemented by field excursions to demonstrate stratigraphic paleontology. Second semester. (Offered 1950-1951.) Mr. Willard

Geol. 213. Applied Stratigraphy (3)

Stratigraphic field problems, laboratory preparation of collected material, megascopic and microscopic studies of sediments. First semester. (Offered 1949-1950.) Messrs. Gault, Willard

Geol. 214. History of Geology (2)

The growth of geology and geologic thought from the Greeks to the present; the great geologists, their theories, controversies and contributions. Reading, conferences, preparation of reports. Second semester. (Offered 1950-1951.) Mr. Whitcomb

Geol. 221. Tectonics (3)

The principles of structural geology; nature and origin of minor structures in crystalline and sedimentary rocks; petrofabrics. Conferences, assigned reading, laboratory and field work. First semester. (Offered 1949-1950.) Mr. Gault

Geol. 232. Advanced Petrography (3)

Advanced work in the use of the petrographic microscope and the universal stage, with reference to rock-forming minerals; microscopic and chemical description and classification of crystalline rocks. Conferences and laboratory work. Second semester. (Offered 1949-1950.) Mr. Gault

Geol. 233. Crystal Structure (2)

Concept of symmetry from the viewpoint of structural crystallography; various types of structures and relations to physical and chemical properties; application of the theory of crystal structure to solid solution, exsolution, isomorphism; interpretation of crystal structure data. Assigned reading of literature. Designed for students in physics, chemistry, metallurgy, and geology who are interested in X-ray investigation and modern theory of atomic structure. First semester. (Offered 1950-1951.) Mr. Weitz

Geol. 234. Physical Crystallography (2)

An advanced course in the geometrical and physical properties of crystals, with special reference to the Goldschmidt method of crystal measurement and projection. Second semester. (Offered 1950-1951.) Mr. Weitz

Geol. 241. Geology of Pennsylvania (3-6)

The geology of Pennsylvania and certain other portions of the east-central United States. The stratigraphic sequence embraces the pre-Cambrian, the entire Paleozoic, most of the Mesozoic and Tertiary, the Pleistocene, and recent deposits. Structures are chiefly those of the northern Appalachians. Conferences, reading assignments, preparation of reports, and field trips. First or second semester. May also be arranged to run throughout the year. Mr. Willard

Geol. 251. Advanced Metallic Economic Geology (3)

Advanced work in ore deposits. Theories of ore deposition, together with detailed work on the type occurrences of some of the metallic or nonmetallic minerals; thorough investigation and report on some mining district, with special regard to the origin of the ores and such commercial aspects of the deposits as may depend chiefly on the geology; preparation and microscopic study of specimens of ores. First semester. (Offered 1950-1951.) Mr. Gault

Geol. 252. Advanced Metallic Economic Geology (3)

Continuation of Geol. 251. Second semester. (Offered 1950-1951.)
Mr. Gault

Geol. 253. Advanced Non-Metallic Economic Geology (3)

Advanced work in non-metallic deposits other than fuels. Theories of formation and details of the more important non-metallic products, with particular attention to Pennsylvania. Each student prepares a report on some one district or a particular type of deposit. First semester. (Offered 1949-1950.) Mr. Weitz

Geol. 254. Advanced Non-Metallic Economic Geology (3)

Continuation of Geol. 253. Second semester. (Offered 1949-1950.)
Mr. Weitz

Geol. 281. Geological Investigation (1-6)

The investigation of special problems. Field, laboratory, library work on some limited area; presentation of a report thereon. Geol. 281 may be elected separately from Geol. 282. First semester. (Offered 1949-1950.)
Messrs. Gault, Jenkins, Weitz, Whitcomb, Willard

Geol. 282. Geological Investigation (1-6)

Similar to Geol. 281. May be elected as a continuation of Geol. 281 or separately. (Offered 1949-1950.)
Messrs. Gault, Jenkins, Weitz, Whitcomb, Willard

GEOPHYSICS, ENGINEERING

See Mining Engineering

GERMAN

Professors More and Palmer
Assistant Professors Lazenby and Schuchard

Ger. 1. Elementary German (3)

Drill in the fundamentals of German grammar; pronunciation; simple conversation and composition; extensive outside reading of simple vocabulary-building texts. No previous study of German required. First and second semesters.

Ger. 2. Elementary German (3)

Continuation of Ger. 1. Prerequisite: *Ger. 1 or the equivalent.* Second semester.

Ger. 3. Intermediate German (3)

German prose and poetry; outside reading; composition. Prerequisite: *one year of college German or two units of entrance German.* First semester.

Ger. 4. Intermediate German (3)

Continuation of Ger. 3. Prerequisite: *Ger. 3 or the equivalent.* Second semester.

Ger. 7. Scientific German (3)

Reading of selected texts in the German of science, with particular emphasis on chemistry and physics. Recitations and individual conferences. Prerequisite: *one year of college German or three units of entrance German.* First or second semester.

Ger. 9. Advanced German, Prose and Poetry (3)

Rapid reading of representative texts; collateral reading. Prerequisite: *two years of college German or three units of entrance German.* First semester.

Ger. 10. Goethe's Faust (3)

Study of Part I; lectures on the origin and development of the Faust story; collateral reading. Prerequisite: *Ger. 9 or high standing in Ger. 3, 4, or 7.* Second semester.

Ger. 22. Conversation and Composition (3)

Review of German grammar; composition and conversation of a more advanced type. Prerequisite: *Ger. 10 or high standing in Ger. 3, 4, or 7.* First or second semester.

For Advanced Undergraduates and Graduates

Ger. 111. Nineteenth Century German Drama (3)

Lectures, reading, reports on assigned work. Prerequisite: *Ger. 10 or the equivalent.* First semester. Messrs. Palmer, More

Ger. 112. Nineteenth Century German Drama (3)

Continuation of Ger. 111. Prerequisite: *Ger. 10 or the equivalent.* Second semester. Messrs. Palmer, More

Ger. 113. Lessing, Goethe, and Schiller (3)

Prerequisite: *Ger. 10 or the equivalent.* First semester. Mr. Schuchard

Ger. 114. Lessing, Goethe, and Schiller (3)

Continuation of Ger. 113. Prerequisite: *Ger. 10 or the equivalent.* Second semester. Mr. Schuchard

Ger. 115. The German Short Story (3)

Origin and development. Rapid reading of illustrative stories, with particular attention to Gottfried Keller, Theodor Storm, C. F. Meyer, and Paul Heyse; lectures and reports. Prerequisite: *Ger. 10 or the equivalent.* First semester. Mr. Lazenby

Ger. 116. The German Short Story (3)

Continuation of Ger. 115. Prerequisite: *Ger. 10 or the equivalent.* Second semester. Mr. Lazenby

GOVERNMENT

See History and Government

GREEK

Professor Crum
Mr. Maurer

Gk. 1. Elementary Greek (3)

For all students who desire to obtain a fundamental knowledge of the Greek language. Early in the semester there will be reading in stories and legends in easy Greek. First semester.

Gk. 2. Elementary Greek (3)

Continued work in Greek vocabulary, forms, and syntax. Selections from Xenophon's *Anabasis.* Second semester.

Gk. 3. Second-Year Greek (3)

Anabasis; Iliad (if time permits); grammar and simple composition. Prerequisites: Gk. 1 and 2, or one year of entrance Greek. First semester. (Offered only when Gk. 1 and 2 have been given in the preceding year.)

Gk. 4. Second-Year Greek (3)

Continuation of Gk. 3. Second semester.

Gk. 7. Thucydides (3)

One or more books. Composition. Prerequisites: Gk. 15 and 16. First semester.

Gk. 8. Tragedy (3)

Euripides: *Medea Bacchae,* or another play; Sophocles: *Oedipus Tyrannus, Antigone,* or another. Literary study of the drama; poetical language, style, and conception; metrical reading; composition. Prerequisites: Gk. 15 and 16. Second semester.

Gk. 9. Dramatic Poetry (3)

Aeschylus: *Agamemnon* or *Prometheus Bound;* Aristophanes: *Clouds, Frogs,* or *Birds;* Aristophanes as humorist and as moralist, with consideration of the tendencies which he satirized; meters; elementary text-criticism. Prerequisites: Gk. 8, 15, and 16. First semester.

Gk. 10. Greek Oratory (3)

Selections from the earlier Attic orators and Desmosthenes. Rapid reading, the student being supposed to have reasonable facility in understanding the Greek directly without rendering into English. Attention is directed largely to those points which illustrate the development of Greek prose style. Prerequisites: Gk. 15 and 16. Second semester.

Gk. 11. Homer (3)

Rapid reading of considerable portions of the *Iliad* or the *Odyssey.* Homeric language, syntax, and meter reviewed with some reference to the needs of intending teachers, but chiefly as a foundation for the study outlined in Gk. 12. Prerequisites: Gk. 15 and 16. First semester.

Gk. 12. Lyric Poetry (3)

Fragments of the elegiac, iambic and melic poets; selections from Pindar of Theocritus. Prerequisites: Gk. 11, 15 and 16. Second semester.

Gk. 13. Hellenistic Greek (3)

New Testament. Selections from Lucian. To be submitted on occasion for Gk. 12. Prerequisites: Gk. 15 and 16, and the approval of the professor. Second semester.

Courses Gk. 9 and 11, 10 and 12 (or 13) are offered in alternate years, and are open to both juniors and seniors.

Gk. 15. Homer and Herodotus (3)

Iliad, I-III, or selected books of the *Odyssey;* Herodotus: selections. Study of the forms and syntax of the Homeric and Ionic dialects; grammatical analysis; reading aloud of Greek; sight-reading; composition. Prerequisites: Gk. 1, 2, 3, and 4, or entrance Greek. First semester.

Gk. 16. Plato (3)

Euthyphro, Apology, or other shorter dialogues. Grammar and composition as in the first semester. Prerequisite: Gk. 15. Second semester.

Gk. 21. Ancient History (3)

The development of civilization from paleolithic times to the world empire of Alexander the Great. The first six weeks are assigned to the stone age, the oriental nations, and the Minoan civilization; the remainder of the semester to Hellenic Greek political history. The social, economic, religious, philosophic, artistic, and literary development of the ancient world; the origin of political institutions. First semester.

Gk. 83. The Economic and Social Life of the Greeks (3)

A study of the activities of the Greeks with special reference to domestic arts, religion, athletics, warfare, medicine, education, social customs and commerce; numismatics and vase painting. Lectures, collateral readings, and reports. Prerequisite: *consent of the instructor.* First semester.

Gk. 99. Ancient Science (3)

A study of the architecture, mining, machinery, medicine, husbandry, etc., as developed by early peoples, especially by the Greeks and the

Romans. A comprehensive view of the knowledge and use of natural resources. No knowledge of the Greek or Latin language is required. Second semester.

For Advanced Undergraduates and Graduates

Gk. 100. Greek Literature in English Translation (3)

The development of the major departments of Greek literature; required readings in English translations, with special attention to the epic, drama, and lyric poetry. First semester. Mr. Crum

Gk. 121. Alexander the Great and the History of the Hellenistic Period (3)

A study of the political and social conditions of the Hellenistic period and the Greek influence upon contemporary and later civilization. First semester. Mr. Crum

Gk. 181. Greek Archaelogy (3)

Aims and methods. A chronological presentation of prehistoric civilizations including the Neolithic, Minoan, Helladic, and Mycenean periods. A study of extant ancient monuments, buildings, and city plans of important sites of the classical and hellenistic periods. Lectures, collateral readings, and reports. Prerequisite: *consent of the instructor.* First semester.

For Graduates

Students desiring to pursue the study of Greek on the graduate level ordinarily will be expected to have had four years of undergraduate work in the language.

Gk. 201. Greek Poetry (3)

The development of poetry in Greece from Homer to the drama, with special study of the lyric poets, and collateral reading. First semester. Mr. Crum

Gk. 202. Greek Poetry (3)

Continuation of Gk. 201. Second semester. Mr. Crum

Gk. 203. Greek Philosophy (3)

The history of philosophic thought in Greece, particularly in the pre-Socratic period. Ritter and Preller's *Historia Philosophiae Graecae,* and collateral reading. First semester. Mr. Crum

Gk. 204. Greek Philosophy (3)

Continuation of Gk. 203. Second semester. Mr. Crum

Gk. 205. Hellenistic Greek (3)

Portions of the Gospel in a comparative study, the Acts, and selected Epistles. Chapters from the Septuagint Patristic literature. Collateral readings. Selections from Lucian. First semester. Mr. Crum

Gk. 206. Hellenistic Greek (3)

Continuation of Gk. 205. Second semester. Mr. Crum

HISTORY AND GOVERNMENT

Professors Harmon, Gipson, Schulz, and Aiken
Assistant Professors Peck, Cowherd, and Kyte
Messrs. Weaver, Howatt, Young, and Daniel; Miss Bolmer

HISTORY

Hist. 11. Development of Western Civilization (3)

The roots of Western civilization; the evolution of economic, social, and political institutions; the impact of scientific and technological developments; the influence of major trends of thought. Required of all freshman engineering students. First semester.

Hist. 12. Development of Western Civilization (3)

The modern Western world; the rise of the nation-state; the occident and the orient; the rise and decay of the older imperialisms; the role of science and idealism in both peace and war in the twentieth century. Required of all freshmen engineering students. Second semester.

Hist. 13. United States History (3)

The era of constitution-making; the evolution of political parties; foreign relations during the wars of the French revolutionary period; the western movement and western state-building; the growth of sectionalism. First semester.

Hist. 14. United States History (3)

The war for the Union; the reconstruction of the South; the era of big industry and labor combinations; the United States as a world power; the new national paternalism. Second semester.

Hist. 25. European History (3)

A rapid survey of the major historic forces from the collapse of the Roman Empire to the sixteenth century; the cultural aspects of medieval society. First semester.

Hist. 26. European History (3)

Continuation of Hist. 25. A detailed account of historic developments from the sixteenth to the nineteenth centuries. Second semester.

Hist. 27. European Expansion and Empire-Building, 1492-1700 (3)

Aspects of the phenomenon of the spread of European civilization and empire into the continents of America, Asia, and Africa. First semester.

Hist. 28. European Expansion and Empire-Building, 1700-1820 (3)

The rivalry of imperial systems; the disappearance of French power in the New World; the movements for independence of the English, Spanish and Portuguese colonials. Second semester.

Hist. 29. Modern Europe (3)

The study of revolution and reaction in western Europe between 1789 and 1870. Emphasis is laid upon the birth, growth, and spread of nineteenth-century liberal doctrines as well as upon the attempts made to stifle that growth by every political and diplomatic means available. First semester.

Hist. 30. Modern Europe (3)

The study of the rise of the new imperialism between 1870 and the present, with emphasis upon the political factors in the break-down of the imperial system. Second semester.

Attention is called also to the following courses in history offered by other departments: Eco. 1, Industrial Evolution; Gk. 21, Ancient History; Lat. 22, Ancient History; Lat. 121, The Roman Republic; Lat. 122, The Roman Empire to the Death of Marcus Aurelius.

For Advanced Undergraduates and Graduates

Hist. 115. Political and Social History of England (3)

The history of the rise and growth of English political and social institutions prior to 1603. First semester. Messrs. Aiken, Cowherd

Hist. 116. Political and Social History of England (3)

The history of the development of English political and social institutions from the death of Elizabeth to the present. Emphasis is placed upon the political and intellectual legacy bequeathed to the modern world as a result of this development. Second semester. Messrs. Aiken, Cowherd

Hist. 117. The Middle East in World History (3)

A survey of the rise of civilization in the Middle East from the times of earliest recorded history until the capture of Constantinople by the Turks in 1453, with special emphasis upon the legacy of Egypt, Persia, and the Hebrew people; oriental and western ideas during Hellenistic and Roman times; rise of Byzantium; rise of Islam and the development of Islamic civilization; Crusades and final triumph of the Ottoman Turks. First semester. Mr. Aiken

Hist. 118. The Middle East in World History (3)

Continuation of Hist. 117. The relations between Europe, America, and the Middle East during the heyday and decline of Ottoman power; western imperialism in the Middle East; Zionism; the strategic importance of this great land bridge between the three continents in modern times to the present day, including the struggle for the control of communications by land, sea, and air, and the control of the vast petroleum reserves in this area. Second semester. Mr. Aiken

Hist. 119. Eighteenth Century European Civilization (3)

This course is concerned with eighteenth-century European civilization. The constitutional, political, economic and social developments within, and institutions of the more dynamic European states of Great Britain, France, Prussia, and Russia will be contrasted and compared. First semester. Mr. Kyte

Hist. 120. Eighteenth Century European Imperialism (3)

This course is concerned with eighteenth-century imperialism. The constitutional, political, economic and social developments within, and institutions of the New World empires of Great Britain, France, Spain, and Portugal when at the height of their power will be contrasted and compared. Second semester. Mr. Kyte

Hist. 127. Development of American Institutions (3)

The colonial origin and national expansion of social, cultural, religious and economic institutions to 1865. First semester. Mr. Cowherd

Hist. 128. Development of American Institutions (3)

A continuation of History 127. Developments from the Civil War to the present, with emphasis on industrialization, urbanization, the populist and progressive movements, and social changes as factors in institutional development. Second semester. Mr. Cowherd

Hist. 129. American Foreign Policy (3)

The French alliance; independence and boundaries; commercial restrictions; French Revolution and neutrality; purchase of Louisiana; War of 1812; acquisition of Florida; Monroe Doctrine; relations with France and Great Britain; Oregon and Texas; the Mexican War. First semester. Mr. Harmon

Hist. 130. American Foreign Policy (3)

The Civil War and possible European intervention; Alaska boundary; War with Spain; the new Caribbean policies; the World War of 1914-1918 and its aftermath; diplomatic events preceding Pearl Harbor; outbreak and prosecution of the war; plans for peace. Second semester. Mr. Harmon

Hist. 131. The Intellectual Expansion of Modern Europe, 1300 to 1789 (3)

A study of the heritage bequeathed to modern Europe by the cultural achievements and traditions of the Renaissance, Reformation, and the 17th and 18th centuries. Special attention will be paid to scientific and technological development and to the growth of political thought and theory during these centuries. First semester. Mr. Peck

Hist. 132. The Intellectual Expansion of Modern Europe, 1789 to the Present (3)

A continuation of the preceding course from the time of the French Revolution to the present, with special attention paid to the effect upon modern thought of the industrial revolution and the rapid advancement in technology. Second semester. Mr. Peck

Hist. 141. Expansion of the English-speaking Peoples, 1100 to 1775 (3)

A study of the political, economic, and social implications of the expansion of the English-speaking peoples throughout the world from the time of the Crusades to the time of the American Revolution. First semester. Mr. Aiken

Hist. 142. Expansion of the English-speaking Peoples, 1775 to the Present (3)

A study of the political, economic, and social growth of the English-speaking communities throughout the world from the time of the American Revolution to the outbreak of the World War II. Second semester. Mr. Cowherd

Hist. 149. Hispanic America in the Nineteenth Century (3)

Successful movements for independence and recognition; types of governments formed in South, Central, and Caribbean America; wars and revolutions; problems pertinent to foreign trade; application of the Monroe Doctrine and its acceptance. First semester. Messrs. Harmon, Kyte

Hist. 150. Hispanic America in the Twentieth Century (3)

Continuation of Hist. 149. Results of the Spanish-American War; Theodore Roosevelt and "big stick" diplomacy; Panama Canal and world trade; debts and interventions; Pan-Americanism; World War and its influence; recent United States relations with Latin America. Second semester. Messrs. Harmon, Kyte

Hist. 151. A Pro-Seminar in United States and Pennsylvania History for Teachers (3)

This course is designed to meet the certification requirements of the Pennsylvania State Council of Education, that all teachers in the public schools should have a course in United States history in which particular emphasis is placed upon the history of Pennsylvania. The following topics will be stressed in the pro-seminar: American colonization; racial origins; the beginnings of agriculture, industry and commerce; the expansion of the frontiers; the movement for independence; constitution-framing; the party system of government; cultural tendencies and progress toward social betterment; the problem of states' versus national rights; the era of great industry. Summer session. Mr. Harmon

Hist. 160. History of American Political Parties (3)

Evolution of major and minor political parties, including the Federalist and Anti-Federalist, the Democratic and Republican, the Populist and

Progressive; party organization and functions; the economic and sectional basis of politics; nomination and election methods; the conduct of campaigns. Summer session. Mr. Harmon

For Graduates

Graduate students desiring to major in history and government should have had at least twelve semester hours of undergraduate work that bear upon this field or in other ways should satisfy the department that they are in a position to undertake profitably the required program of study.

Candidates for the master's degree may qualify either by completing successfully thirty hours of approved course work and passing an examination covering the entire field or by completing twenty-four hours in approved courses and submitting a satisfactory thesis. Each candidate will select, upon the advice and with the approval of the head of the department, the plan better suited to his needs and abilities.

All graduate students majoring in history and government are expected to take Hist. 227 and 228, Research Methods in the Social Sciences.

Hist. 201. English Institutional History (3)

Political, social, economic, and religious institutions which have influenced American civilization most profoundly. First semester.
Messrs. Aiken, Cowherd

Hist. 202. English Institutional History (3)

Continuation of Hist. 201. Second semester. Messrs. Aiken, Cowherd

Hist. 203. England Under the Tudors (3)

An intensive study of England during the period 1485-1603. Special emphasis will be placed upon the social background. First semester. (Not offered 1949-1950.) Mr. Aiken

Hist. 204. England Under the Tudors (3)

A continuation of Hist. 203. Second semester. (Not offered 1949-1950.)
Mr. Aiken

Hist. 205. England Under the Stuarts (3)

A study of the religious, political, and economic problems of the seventeenth century. First semester. Mr. Aiken

Hist. 206. England Under the Stuarts (3)

A continuation of Hist. 205, but with particular stress upon social and literary activities. Second semester. Mr. Aiken

Hist. 207. The Legacy of Modern England, 1689-1867 (3)

The Revolution of 1689 and subsequent parliamentary changes; the British Empire and further expansion; the French Revolution and Napoleonic Wars; agricultural and industrial revolutions; parliamentary reform; factory, penal, and other reforms; England's contribution to western civilization. First semester. (Not offered 1949-1950.) Mr. Aiken

Hist. 208. The Legacy of Modern England since 1867 (3)

Social legislation since 1867; England's colonial empire and institutions; British Commonwealth of Nations; England in world affairs. Second semester. (Not offered 1949-1950:) Mr. Cowherd

Hist. 210. The British Commonwealth of Nations (3)

A survey of the British Empire during the nineteenth century, its metamorphosis into the Commonwealth of Nations, and an attempt to estimate its present significance. Summer session. Messrs. Aiken, Cowherd

Hist. 211. English Colonization in North America in the Seventeenth Century (3)

The activities of the great overseas trading companies; the problem of proprietorial control; the decline of the chartered colonies; conflicts between opposing political, economic, and religious ideals within the colonies. Summer session. (Not offered 1949.)

Hist. 212. English Colonization in North America in the Seventeenth Century (3)

Continuation of Hist. 211. Second semester. (Not offered 1949-1950.) Mr. Kyte

Hist. 213. America in the Eighteenth Century (3)

The workings of the English mercantile system; the evolution of colonial institutions; the international struggle for the fur trade in North America; George III and the new administrative system. First semester. (Not offered 1949-1950.) Mr. Kyte

Hist. 214. America in the Eighteenth Century (3)

Continuation of Hist. 213. Second semester. (Not offered 1949-1950.) Mr. Kyte

Hist. 215. American Constitutional History (3)

The major problems involved in the growth of the powers of the national government. First semester. Messrs. Cowherd, Harmon

Hist. 216. American Constitutional History (3)

Continuation of Hist. 215. Second semester. Messrs. Cowherd, Harmon

Hist. 217. America as a World Power (3)

The results of the Spanish-American War; the United States' Pacific possessions; Theodore Roosevelt and world affairs; Knox and "Dollar Diplomacy"; World War I; American neutrality; the United States as a belligerent; the Treaty of Versailles. First semester. Mr. Harmon

Hist. 218. America as a World Power (3)

The United States and the League; the reconstruction of Europe; the rise of Hitler; World War II; the Monroe Doctrine; the "Good Neighbor Policy"; the problems of the Pacific: China and Japan; Japan and the United States; the War with Japan. Second semester. Mr. Harmon

Hist. 219. Modern Europe, 1815-1870 (3)

Era of Metternich; Congress of Vienna and reconstruction of Europe; industrial revolution and subsequent social reforms; France and Germany; democracy and nationalism; Second French Empire; unification of Italy and Germany. First semester. Messrs. Kyte, Peck

Hist. 220. Modern Europe since 1870 (3)

Latin and Teutonic Europe; Great Britain and Ireland; Russia and the Dardanelles; Turkey and Europe; nationalism and the new imperialism; World War I and the Treaty of Versailles; League of Nations; national socialism vs. democracy; thirst for power; World War II and its aftermath. Second semester. Messrs. Kyte, Peck

Hist. 227. Research Methods in the Social Sciences (3)

Technique of research along the lines of historical method; training in the critical handling of documentary materials, in measuring the value of evidence, and in formal presentation of the results of research. Required of all graduate students in history and government. First semester. Messrs. Harmon, Kyte

Hist. 228. Research Methods in the Social Sciences (3)

In this course the emphasis will be placed upon historiography. Second semester. Messrs. Harmon, Kyte

Hist. 245. The United States, 1776-1800 (3)

Revolutionary movement and the Revolution; patriots and loyalists; diplomats and diplomacy; early state constitutions and the Articles of Confederation; Constitutional Convention of 1787 and the Constitution; Federalists in control; plots and conspiracies; rise of the Republican party; downfall of the Federalists. First semester. Mr. Harmon

Hist. 246. The United States, 1800-1850 (3)

Jeffersonian democracy; territorial expansion; War of 1812; new nationalism; sectionalism; protective tariffs; slavery and expansion; Texas; Mexican War; compromise measures of 1850. Second semester. Mr. Harmon

Hist. 247. The United States, 1850-1898 (3)

Background of the Civil War; rise of the Republican party; Buchanan's policy; election of 1860; Lincoln's attitude; views of Northern and Southern leaders; war powers of the President; downfall of the Confederacy; reconstruction; Grant's administration; big business; organized labor; granger movement; Bryan and silver; Cuba and Spain. First semester. (Not offered 1949-1950.) Mr. Harmon

Hist. 248. The United States since 1898 (3)

Causes and results of the Spanish-American War; insular possessions; Theodore Roosevelt's policies; Progressive movement; Wilson and reform; World War I: speculative 1920's; the great depression; Democrats in control; Franklin D. Roosevelt's domestic and foreign policies; aftermath of World War II. Second semester. (Not offered 1949-1950.)

Mr. Harmon

GOVERNMENT

Govt. 1. The Foundations of Government (3)

A survey of the basic problems of governmental organization and operation, with emphasis on controversial issues and on the relevant political institutions and practices, both contemporary and past, of American, European, and Asiatic peoples. First and second semesters.

Govt. 2. American Political Ideas (3)

A survey of the ideas underlying and associated with the political institutions and practices of the United States. Prerequisite: Govt. 1. Second semester.

Govt. 3. Foreign Governments (3)

The governmental systems of selected foreign countries, including Great Britain, Russia, France, Germany, and Japan. Prerequisite: Govt. 1. First semester.

Govt. 4. Political Parties and Electoral Problems (3)

The organization, functions, and techniques of political parties; pressure groups and pressure politics; nomination and election methods. Prerequisite: Govt. 1. Second semester.

Govt. 41. Law Making (3)

The organization and procedure of legislative and constituent bodies, national, state, and local; the problem of legislative leadership; the role of the executive and administrative authorities in policy determination; sources of information; pressure groups and policy determination; the initiative and the referendum. First semester. (Discontinued 1948-1949.)

Govt. 42. Public Administration (3)

The nature of administration; problems of organization and management; line, auxiliary, and staff functions; public personnel policies; budgeting and budgetary systems; purchasing; forms of administrative responsibility. Second semester. (Discontinued 1948-1949.)

Govt. 51. American National Government (3)

Constitutional principles; organization and operation of the national government; the party system; citizenship and civil rights. First semester.

Govt. 52. American State Government (3)

The position of the states in the union; machinery and functions of state governments; nominations and elections; the various systems of local government. Second semester.

For Advanced Undergraduates and Graduates

Govt. 151. Constitutional Law (3)

The law of the Constitution as expounded by the Supreme Court of the United States. First semester. Mr. Schulz

Govt. 157. City Government (3)

The machinery and processes of city government in the United States; city-state and federal-city relations; the problems of metropolitan areas; forms of city government, with special emphasis on the operation of the council-manager plan. First semester. Mr. Schulz

Govt. 160. Public Administration (3)

The nature of administration; problems of organization and management; public personnel policies; budgeting and budgetary systems; forms of administrative responsibility. Second semester. Mr. Schulz

Govt. 163. Contemporary Political Thought (3)

Analysis of the basic concepts of political science: state, government, sovereignty, law, liberty, rights; consideration of authoritarian and popular government; federal and unitary systems. First semester. Mr. Schulz

Govt. 164. Contemporary Political Thought (3)

Theories concerning the proper rôle of the State in society and the ethical justification of political coercion; political aspects of anarchism, communism, socialism, fascism, and political pluralism. Second semester. Mr. Schulz

For Graduates

Govt. 251. American Political Institutions (3)

The federal and state constitutions; Congress and the state legislatures; the presidency; state governors; the judicial system; political parties; nomination and election methods; local government; the council-manager plan. First semester. Mr. Schulz

Govt. 252. American Political Institutions (3)

Continuation of Govt. 251. Prerequisite: Govt. 251. Second semester. Mr. Schulz

Govt. 263. Seminar in Political Theory (3)

Consideration of theories concerning the nature of the state, its origin, and its rôle in society. Prerequisites: Govt. 163, 164. First semester. Mr. Schulz

Govt. 264. Seminar in Political Theory (3)

Continuation of Govt. 263. Prerequisites: Govt. 163, 164, 263. Second semester. Mr. Schulz

INDUSTRIAL ENGINEERING

See Mechanical Engineering

INTERNATIONAL RELATIONS

Professor Godshall
Assistant Professor Dunlap
Mr. Williamson

Int. Rel. 1. Diplomacy (3)

Scrutiny of the methods and objectives of diplomacy, with particular emphasis upon illustrative examples drawn from documentary materials portraying negotiations and policies as actually pursued by statesmen striving for position and power. First semester.

Int. Rel. 2. Diplomacy (3)

Continuation of Int. Rel. 1. Second semester.

Int. Rel. 11. The Diplomacy of Europe 1850-1919 (3)

The development of alliances and other associations of nations, with resultant tensions and frictions; the causes of successive wars; the character of peace settlements. First semester.

Int. Rel. 12. The Diplomacy of Europe since 1919 (3)

Continuation of Int. Rel. 11. Second semester.

Int. Rel. 21. The Diplomacy of the Far East to 1919 (3)

The opening of China and Japan; the transformation of Japan; the partition of China; international rivalries in Korea, Manchuria, the Philippines, Southeastern Asia and the Indies; economic and territorial imperialism. First semester.

Int. Rel. 22. The Diplomacy of the Far East since 1919 (3)

An analysis of recent and contemporary political and economic problems confronting not only the countries of the Orient but the western powers with interests in that region; Japan's aspirations to establish a "New Order in Greater East Asia"; frustration and remotivation of Japan; prerequisites for peace and security in the Far East and the Pacific region. Second semester.

Int. Rel. 31. The Diplomacy of Russia and the Middle East to 1919 (3)

The growth of Tzarist power and influence, impinging upon weaker states and affecting the holdings of other great powers. First semester.

Int. Rel. 32. The Diplomacy of Russia and the Middle East since 1919 (3)

The effect of the ascension of Soviet power and influence upon neighboring and other states. Second semester.

For Advanced Undergraduates and Graduates

Int. Rel. 112. The World since 1919 (3)

The peace treaties of 1919; the ideals and realities of the League of Nations; efforts to effect disarmament; the resurgence of power politics as displayed by the German-Italian-Japanese Axis; appeasement; frustration; the war of 1939-1945; post-war occupation of Axis countries; problems of reconciliation of conflicting objectives and interests among the victors. (Offered Summer 1949.) Mr. Godshall

Int. Rel. 122. The Far East since 1919 (3)

Japanese quests for hegemony through extension of influence and control; the decline of Western prestige and power; movements toward independence; nationalism. (Offered Summer 1949.) Mr. Godshall

Int. Rel. 132. Russia in World Affairs (3)

An appraisal of the objective and tactics of Tzarist and Soviet diplomacy, with particular emphasis upon Russian status as one of the great powers. (Offered Summer 1949.) Mr. Dunlap

Int. Rel. 141. International Relations (3)

Attention is focused upon the basic factors contributing to contemporary friction; elements of international cooperation in dealing with historic and current issues of international politics. First semester. Mr. Godshall

Int. Rel. 142. International Relations (3)

Continuation of Int. Rel. 141. Second semester. Mr. Godshall

Int. Rel. 151. International Organization (3)

Study of the constitutional and political character of successive agencies of international organization, with particular emphasis upon the League of Nations. First semester. Mr. Godshall

Int. Rel. 152. International Organization (3)

Continuation of Int. Rel. 151 with emphasis upon the United Nations. Second semester. Mr. Godshall

Int. Rel. 161. International Law (3)

Consideration of the principles and rules generally recognized as binding upon the community of nations in time of peace; recognition of the existence and termination of states; nationality and protection of persons; acquisition and loss of territory; control over territorial waters; piracy; asylum; state responsibility and international claims. First semester. Mr. Dunlap

Int. Rel. 163. International Law (3)

Principles applicable to the conduct of hostilities in wartime; rules of war; treatment of prisoners; transfer of property; establishment and disposition of "war guilt"; recognition of governments instituted by force; problems of neutrality. Second semester. Mr. Dunlap

For Graduates

Int. Rel. 241. Seminar in International Relations (3)

Intensive analysis of selected forces and problems of world politics, including forms of political organization, imperialism, nationalism, limitation of armaments, the munitions industry, propaganda, censorship, pacific settlement of international disputes, renunciation of war, collective security, geo-politics, natural resources, trade and tariffs, currency exchange and controls, communications, debts, foreign investments, population pressure, peace settlements. First semester. Mr. Godshall

Int. Rel. 242. Seminar in International Relations (3)

Continuation of Int. Rel. 241. Second semester. Mr. Godshall

Int. Rel. 251. Seminar in International Organization (3)

Intensive analysis of selected agencies and activities of the United Nations and its affiliated institutions. First semester. Mr. Godshall

Int. Rel. 252. Seminar in International Organization (3)

Continuation of Int. Rel. 251. Second semester. Mr. Godshall

Int. Rel. 261. Seminar in International Law (3)

Intensive analysis of the principal theories concerning the nature of international law and its fundamental conceptions, with special studies of their application and significance in contemporary international society. First semester.

Int. Rel. 262. Seminar in International Law (3)

Continuation of Int. Rel. 261. Second semester.

ITALIAN

See Romance Languages

JOURNALISM

See English

LATIN

Professor Wright
Mr. Maurer

Lat. 1a. Latin (3)

For freshmen who enter with four units of Latin. Selected letters of Pliny and Cicero. Development of letter writing among the Romans and its influence on modern literature. Prerequisite: four years of high school Latin. First semester. (Not offered 1949-1950.)

Lat. 1b. Latin (3)

For freshmen who enter with three units of Latin. Vergil's *Bucolics* and *Æneid* I-VI, or selections from Ovid. Practice in reading aloud and scansion; training in sight translation; the mythology and religion of Greece and Rome; the influence of Latin poetry upon English literature. Prerequisite: three units of high school Latin. First semester.

Lat. 2. Horace (3)

Selected Odes. Lectures on the history and development of lyric poetry; constant practice in reading the more important lyric meters; memorizing of stanzas and passages. Prerequisite: Lat. 1a or 1b. Second semester.

Lat. 4. Livy (3)

Selections from earlier books. Some study of early Roman history and topography. Selected poems of Catullus. Prerequisites: Lat. 1 and 2. First or second semester.

Lat. 13. Latin Drama (3)

Drama among the Romans; native dramatic performances; indebtedness to Greek drama; the various dramatic forms and their vogue; chief writers; dramatic festivals; the Roman theater; influences on later literature. Reading of selected plays of Plautus, Terence, and Seneca. Prerequisite: Lat. 2. First or second semester.

Lat. 22. Ancient History (3)

Continuation of Gk. 21. The Hellenistic Age. Rome from its origin to 395 A.D. Second semester.

Lat. 31. Beginning Latin (3)

Special emphasis on English derivations and the principles of grammar. First semester.

Lat. 32. Cæsar (3)

The Gallic War, Books I-IV. Prose composition and syntax. Second semester.

Lat. 33. Cæsar (3)

Selections from the later books of the *Gallic War* or from the *Civil War.* Prose composition and syntax, with emphasis on clause construction. For students who enter with two years of high school Latin and who elect to continue Latin. Prerequisite: two years of high school Latin. First semester.

Lat. 34. Cicero (3)

Continuation of Lat. 33. Cicero's orations and either *de Senectute* or *de Amicitia.* Prerequisite: Lat. 33. Second semester.

Lat. 84. The Economic and Social Life of the Romans (3)

A general survey of Roman life under the following headings: commerce, trade, industrial and domestic arts, agriculture, religion, athletics, amusements, warfare, medicine and surgery, education, marriage and funeral customs, costume, houses, and furniture. Lectures, collateral readings and reports. Prerequisite: *consent of the instructor.* Second semester. (Not offered 1949-1950.)

For Advanced Undergraduates and Graduates

Lat. 105. Satire (3)

Selected satires of Horace and Juvenal. Lectures on the history of Roman satire and its influence on modern literature; study of social conditions under the empire. Prerequisites: Lat. 4 and 13. First semester. (Not offered 1949-1950.) Mr. Wright

Lat. 106. Roman Prose Writers of the Empire (3)

Selections from the following: Petronius, *Cena Trimalchionis;* Apuleius, Cupid and Psyche story from the *Metamorphoses;* Suetonius, *Lives;* Seneca, *Moral Epistles* and *Dialogues;* Tacitus, *Germania.* Prerequisites: Lat. 4 and 13. Second semester. (Not offered 1949-1950.)

Lat. 107. Vergil (3)

Æneid, Books VII-XII. Continuation of Lat. 108. Prerequisites: Lat. 4 and 13. First or second semester. (Not offered 1949-1950.) Mr. Wright

Lat. 108. Lucretius (3)

The finest literary passages and selected passages illustrating his philosophy. Ennius and some study of early Roman epic. Vergil's sixth *Æneid;* an intensive study of its debt to Greek literature, religion, and philosophy, and its influence on modern literature. Lectures on the history of the epic; collateral reading in the great epics of other literatures. Prerequisites: Lat. 4 and 13. First or second semester. (Not offered 1949-1950.) Mr. Wright

Lat. 109. Latin Prose Composition (3)

Exercises in translating from English into Latin, with a collateral study of Latin grammar. Special attention to clause construction and other points of syntax. Students preparing to teach Latin are expected to elect this course. Prerequisites: Lat. 4 and 13. First or second semester. (Not offered 1949-1950.)

Lat. 121. The Roman Republic (3)

Special emphasis on governmental and social problems of the last two centuries B.C. and the Hellenistic Greek background of the Roman Empire. Prerequisites: Gk. 21; Lat. 22. First or second semester. (Not offered 1949-1950.)

Lat. 122. The Roman Empire to the Death of Marcus Aurelius (3)

Special emphasis upon the development of the principate, and upon the social and economic structure of Rome, the provinces, and the municipalities. Prerequisites: Gk. 21; Lat. 22, 121. Second semester. (Not offered 1949-1950.)

Lat. 125. Latin Literature in English Translation (3)

A study of Latin literature by means of the best English translations. No knowledge of the Latin language is required. The lives of the most important authors are studied and their works read according to the major departments of literature—history, comedy, epic, lyric, etc. Emphasis is placed on the chronological development of the literature and historical background necessary to the interpretation of the author's works. Lectures and readings with special reports. First or second semester.

Mr. Wright

Lat. 182. Archæology of Italy (3)

Neolithic, Terramare, Villanovan, and Etruscan cultures. Rome the City; its buildings, monuments, and streets, its destruction and rediscovery through excavation; origin and growth of the city; the three periods, empire, republic, and kingdom; methods of identifying and dating monuments. A survey of Pompeii, Herculaneum and Ostia. Lectures, readings, and reports, Prerequisite: *consent of the instructor.* First or second semester.

Mr. Wright

For Graduates

For admission to graduate courses the student must satisfy the department of his fitness and adequate preparation. It is generally preferred that applicants have completed twenty-four semester hours of undergraduate college Latin in an approved college or university.

Lat. 201. Latin Epigraphy (3)

Text book supplemented by frequent use of the *Corpus Inscriptionum Latinarum* and the standard texts of some of the longer inscriptions, illustrating Roman political institutions, public and private life, and religion. First semester. (Not offered 1949-1950.) Mr. Wright

Lat. 202. Topography and Monuments of Ancient Rome (3)

Lectures (usually illustrated) on the origin, growth, and destruction of ancient Rome and on modern methods of identifying extant monuments; frequent reports based on a detailed study of the discoveries affecting individual sites. First or second semester. (Not offered 1949-1950.)

Mr. Wright

Lat. 203. Ovid's Fasti (3)

Substantially the whole of the *Fasti.* Lectures on the religion of ancient Rome and numerous reports on the various festivals treated in Ovid's poem and its sources. First or second semester. (Not offered 1949-1950.)

Mr. Wright

Lat. 205. Roman Epic (3)

Lectures on the history of epic poetry; intensive study of the *Æneid* of Vergil and its sources. First semester. (Not offered 1949-1950.)
Mr. Wright

Lat. 207. Seminar (3)

Intensive study and reports on the text, history, and interpretation of some work chosen from one of the following authors: Livy, Ovid, Horace, Vergil, Cicero, Celsus, Quintilian, and Pliny. First or second semester. (Not offered 1949-1950.) Mr. Wright

Lat. 208. Tacitus (3)

Readings of selections, especially from the *Annals.* The material on Tiberius and Nero will be particularly studied. Collateral work in Suetonius and Cassius Dio. A study of the comparative credibility of Tacitus, Suetonius, and Dio. Frequent reports by students. First or second semester. (Not offered 1949-1950.)

Lat. 209. Cicero's Letters (3)

Reading of a large selection of the letters of Cicero; study of the political and social background of the period. The other works of Cicero will be used to illustrate the letters. Particular attention will be paid to material of value to teachers of Cicero in the secondary schools. First or second semester. (Not offered 1949-1950.)

LAW

See Accounting

MATHEMATICS AND ASTRONOMY

Professors Raynor, Smail, Shook, and Pitcher
Associate Professors Lamson, Cutler, Latshaw, and Stoll
Assistant Professors Beale, Van Arnam, Cowling, Hailperin,
Chellevold, Wentworth, Petrie, P. Meier, and Wilansky
Messrs. Benson, Spohn, Mettler, Kenny, Tikson, and Townsend

In the department of mathematics and astronomy undergraduate majors are offered in mathematics, in mathematics and astronomy, and in actuarial science. For details of the requirements see the outline of major sequences in the section describing the College of Arts and Science.

MATHEMATICS

Math. 1. Plane Trigonometry (3)

First semester.

Math. 1b. General Mathematics for Students of Business (3)

Review of elementary algebra; graphs and charts, the straight line law, the law of the parabola; logarithms; arithmetic and geometrical progressions; the exponential law, the power law; curve fitting, permutations, combinations, and probability. First and second semesters.

Math. 11. Algebra and Analytic Geometry (3)

Algebra review; theory of equations, progressions, binomial theorem, complex numbers; introduction to analytic geometry. Prerequisite: *Math. 1 or entrance credit in plane trigonometry.* First and second semesters.

Math. 11a. Solid Geometry and Analytic Geometry (3)

Essentials of solid geometry with emphasis on mensuration; introduction to analytic geometry. Prerequisite: *Math. 1 or entrance credit in plane trigonometry.* First and second semesters.

Math. 12. Analytic Geometry and Calculus (3)

Trigonometric, exponential, and logarithmic curves; differentiation of algebraic and transcendental functions; integration with simple applications. Prerequisite: *Math. 11.* First and second semesters.

Math. 13. Calculus (3)

Parametric equations, polar coordinates; extensive drill in the technique of integration; solid analytic geometry. Prerequisite: *Math. 12.* First and second semesters.

Math. 14. Intermediate Calculus (3)

Infinite series; hyperbolic functions; partial derivatives; multiple integrals, centroids, moments of inertia, etc.; differential equations. Prerequisite: *Math. 13.* First and second semesters.

Math. 15. Reading Course in Mathematics (1)

Credit not to exceed one hour per semester, total credit not to exceed three hours; approval of program and written report required. Prerequisite: consent of the head of the department. First and second semesters.

Math. 16. Solid and Spherical Geometry and Spherical Trigonometry (3)

Open to all students, particularly advised for students of astronomy. Given when there is sufficient demand. First semester.

Math. 23. General Mathematics for Students of Business. Second Course (3)

Fundamental ideas of analytic geometry and calculus, and selected topics of algebra, with numerous applications to problems of business and the social sciences. Prerequisite: *Math. 1b.* Second semester.

Math. 24. General Mathematics for Students of Business, Third Course (3)

Continuation of Math. 23. First semester.

Math. 40. Mathematics of Finance (3)

Compound interest, and elementary treatment of annuities, etc. Prerequisite: *Math 1b or 11.* First and second semesters.

Math. 42. Introduction to Mathematics of Statistics (3)

Frequency tables; averages; probability; the normal curve; sampling theory; correlation theory in two-way space. Prerequisite: *Math 1b or consent of the instructor.* Second semester.

Math. 43. First Course in Mathematics of Life Insurance (3)

Mathematical theory of life contingency; preparation of life and monetary tables; computation of premiums for various life insurance policies; valuation of policies to meet statutory requirements; mathematical theory of risk and cost of insurance; computation of items for annual reports; valuation of life annuities. Prerequisite: *Math. 40.* First semester.

Math. 51. Advanced Algebra (3)

Complex numbers; theory of equations, with applications to classical problems, Sturm's theorem, etc.; determinants; the theory of resultants. Prerequisite: *Math. 12.* First semester.

Math. 54. Higher Geometry (3)

An introductory course in projective geometry and non-euclidean geometry. Prerequisite: *Math. 13, previously or concurrently.* Second semester.

For Advanced Undergraduates and Graduates

Math. 101. Vector Analysis (3)

The theory and method of vector analysis as applied in physics and pure mathematics. Prerequisite: *Math 14.* First semester.

Messrs. Latshaw, Shook

Math. 102. Finite Differences (3)

Definition of differences of various orders; the operators Δ and E; interpolation formulas for both equal and unequal intervals: central difference interpolation formulas; inverse interpolation; finite summation; differences of zero; relations between the operators Δ and D; differences of a product; finite summation by parts; some modern extensions and special devices for interpolation and summation; numerous examples illustrating the use of the theory. Prerequisites: *Math. 14;* Math. 40 and 43. First or second semester.

Mr. Beale

Math. 103. Mathematical Logic (3)

An introductory course in symbolic logic designed primarily to acquaint the student with the principles of reasoning used in mathematics. Prerequisites: Math. 14, or Phil. 14, or consent of the instructor. First or second semester.

Mr. Hailperin

Math. 106. Advanced Calculus (3)

Line and surface integrals, elementary differential equations, complex variables, Fourier series, and other selected topics. Prerequisite: *Math. 14.* First and second semesters. Messrs. Cowling, Cutler, Hailperin, Lamson, Latshaw, Pitcher, Raynor, Stoll, Smail, Wilansky

Math. 109. Principles of Analysis (3)

The real number system; limits; continuous and discontinuous function; differentiation; integration; infinite series; absolute and uniform convergence; functions of more than one variable; implicit functions. Required of majors in mathematics except majors in actuarial science. Prerequisite: *Math. 14.* First semester.

Math. 110. Principles of Analysis (3)

Continuation of Math. 109. Required of majors in mathematics except majors in actuarial science. Second semester.

Math. 111. Differential Equations (3)

Special solvable non-linear equations, linear equations, transformations, and symbolic methods; solutions in series; Ricatti's, Bessel's, and Legendre's equations. Prerequisite: *Math. 14.* First semester. Messrs Cutler, Shook

Math. 112. Differential Equations and Harmonic Analysis (3)

Continuation of Math. 111. Partial differential equations, Fourier series, cylindrical and spherical harmonics. Second semester. Messrs. Cutler, Shook

Math. 115. Theory of Functions of a Complex Variable (3)

Algebra of complex numbers; analytic functions; Cauchy-Riemann equations; Laplace's equation; conformal mapping; integrals of complex functions; Cauchy's theorem; power series; Taylor's theorem; Laurent's theorem; residues; applications to physical and geometrical problems. Prerequisites: *Math. 106, or Math. 109 and 110.* First semester. Mr. Smail

Math. 123. Probability (3)

A course designed primarily for students majoring in actuarial science. Prerequisite. *Math. 14.* First semester. Mr. Beale

Math. 124. Theory of Errors and Least Squares, Empirical Formulas (3)

Probability; least squares and its application in the study of errors; formation of empirical formulas; numerical methods. Designed for students engaged in experimental or observational work. Prerequisite: *Math. 14.* Second semester. Mr. Latshaw

Math. 131. Mathematical Statistics (3)

Moments; moment generating function; normal distribution function; Poisson distribution function; large sample theory of a single variable; linear regression and linear correlation; distribution functions of two variables; small sample distributions; the chi square distribution; Student's *t* distribution. Prerequisite: *Math. 14.* Messrs. Latshaw, Meier

Math. 140. Higher Algebra (3)

Theory of matrices and linear transformations; linear spaces; bilinear and quadratic forms. Prerequisite: Math. 51. First semester. Mr. Stoll

Math. 141. Higher Algebra (3)

Some basic concepts of higher algebra: groups, rings, fields, lattices; algebra of classes; Boolean algebra. Second semester. Mr. Stoll

For Graduates

Math. 200. Fundamental Concepts of Mathematics (3)

Summer session only.

Math. 201. Elementary Theory of Functions of Real Variables (3)

Elements of the theory of sets of points, including the Weierstrass-Bolzano and the Heine-Borel theorems; fundamental properties of continuous functions; basic ideas of differentiation: theory of Riemann integration of continuous functions; convergence, absolute convergence, and uniform convergence of infinite series and infinite products. Prerequisite: Math. 106. Second semester. Mr. Pitcher

Math. 209. Mathematics Seminar (3)

Reports on special topics of the literature of mathematics and of individual research. Prerequisite: graduate standing and consent of the instructor. First semester. Messrs. Cowling, Cutler, Hailperin, Lamson, Latshaw, Pitcher, Raynor, Smail, Stoll

Math. 210. Mathematics Seminar (3)

Continuation of Math. 209. Second semester.

Math. 211. Infinite Processes (3)

Fundamental limit notions applied to infinite sequences, infinite series, infinite products, etc. First semester. Mr. Smail

Math. 212. Infinite Processes (3)

Continuation of Math. 211. Second semester. Mr. Smail

Math. 216. Theory of Functions of a Complex Variable (3)

More detailed and more rigorous treatment of the theory of analytic functions than in Math. 115, and, in addition, the study of a number of more advanced topics. Prerequisite: *Math. 115 or its equivalent.* Second semester. Mr. Smail

Math. 217. Theory of Elasticity (3)

Theory of stress and strain; tension and thrust with applications; bending of rods and plates; equilibrium of curved rods, cylinders, and spheres. First semester. Mr. Raynor

Math. 218. Theory of Elasticity (3)

Continuation of Math. 217. Second semester. Mr. Raynor

Math. 219. Selected Topics in Quantum Mechanics and Relativity (3)

Lagrange's equations; Hamilton's partial differential equation; Schroedinger's wave equation, with incidental introduction of characteristic functions of second order differential equations; the work of Dirac and others. The relativity part of the course is of the conventional type. First semester. Mr. Lamson

Math. 220. Selected Topics in Quantum Mechanics and Relativity (3)

Continuation of Math. 219. Second semester. Mr. Lamson

Math. 223. Differential Geometry (3)

The differential geometry of curves and surfaces. Prerequisite: Math. 106. First semester. Mr. Cutler

Math. 224. Differential Geometry (3)

Continuation of Math. 223. The differential geometry of surfaces and Riemann spaces; tensor analysis. Second semester. Mr. Cutler

Math. 229. Advanced Analytic Mechanics (3)

Conservative and non-conservative field; generalized co-ordinates; Lagrange's equations; Hamilton's canonical equations; holonomic and non-holonomic system; gyroscopic motion, etc. Prerequisite: *Mech. 101 or consent of the instructor.* First semester. Messrs. Lamson, Raynor.

Math. 230. Advanced Analytic Mechanics (3)

Continuation of Math. 229. Second semester. Messrs. Lamson, Raynor

Math. 231. Calculus of Variations (3)

Fundamental existence theorems of analysis: the classical theory of necessary and of sufficient conditions for relative minima of single integrals; fields of extremals and the Hamilton-Jacobi theory; numerous physical and mechanical applications and extensions, to be chosen according to the special interests of the students. Second semester. Messrs. Lamson, Pitcher

Math. 241. Theory of Functions of Real Variables (3)

Brief discussion of the real numbers; continuous functions, semi-continuous functions, functions of bounded variation, and other important classes; the derivative; modern theory of measure and integration; important inequalities; implicit function theorem and other existence theorems of analysis. Second semester. Mr. Pitcher

Math. 242. Introduction to Topology (3)

Elements of point-set topology, with emphasis of applications to Euclidean spaces and spaces of functions; combinatorial topology, with applications of connectivity. Second semester. Mr. Pitcher

Math. 250. Modern Algebra (3)

The development of a topic from the field of modern algebra, e.g. linear algebra, rings with minimal conditions, Galois theory of equations, valuation theory, lattic theory. Second semester. Mr. Stoll

Math. 253. Modern Methods in the Theory of Functions of a Complex Variable (3)

Analytic continuation; principle of maximum modulus; conformal representation; Taylor series analysis; integral functions; Dirichlet series. Prerequisite: *Math. 216.* First semester. Mr. Cowling

Math. 254. Selected Topics in the Theory of Functions of a Complex Variable (3)

Dirichlet series, with application to the analytic theory of numbers; Taylor series; entire and meromorphic functions; normal families of functions. Prerequisite: *Math. 253.* Second semester. Mr. Cowling

ASTRONOMY

Astr. 1. Descriptive Astronomy (3)

The earth as an astronomical body; the solar system; a brief introduction to sidereal astronomy. First and second semesters.

Astr. 2. General Astronomy (3)

The solar system; the sidereal system, with an introduction to celestial mechanics and astrophysics. Prerequisite: *Math. 13.* Second semester.

Astr. 3. Practical Astronomy (3)

Instruments used; methods of taking and reducing observations to determine time, latitude, and azimuth; observatory work in which each student makes his own observations and computations in illustration of the theory studied. Prerequisites: *Astr. 2, Math. 14.* Second semester.

Astr. 4. Stellar Astronomy and Astrophysics (3)

Introduction to astrophysics; the sun considered as a star; physical characteristics of the stars; stellar motions; binary stars; theory of binary star orbits; stellar aggregations; cosmogony. Prerequisites: *Math. 14, Physics 23.* First or second semester.

MECHANICAL AND INDUSTRIAL ENGINEERING

Professors Stuart, Klein, and Bates
Associate Professors Erdoss, Holme, Jackson, and J. B. Hartman
Assistant Professors Kelly, Sweeney, and Gould
Messrs. Beauchamp, Rawson, Shay, Wetmore, Whitehead, Wilbur, Wehby, Dominic, Funk, Junkin, and Shaw

MECHANICAL ENGINEERING

M.E. 3. Machine Shop Practice, 4 weeks (4)

This course is given at the local technical high school during the summer session following the freshman year. Work on the various machine tools, use of hand tools, and the various methods of welding. Summer session.

M.E. 6. Elementary Heat Power (3)

Introductory work on steam engines and turbines, boilers, pumps, condensing equipment, air conditioning and refrigerating apparatus, internal combustion engines; fuels; combustion; Diesel engines and gas turbines. Prerequisites: *Freshman Math., Phys., and Chem.* First and second semesters. (Discontinued 1948-1949.)

M.E. 10. Instruments Laboratory (1)

An introduction to mechanical laboratory, covering a study of instruments, their construction, use, errors and calibration. Prerequisite: *Phys. 23.* First semester.

M.E. 11. Mechanical Engineering Laboratory (1)

Experimental study of fluid flow, metering, and heat transfer. Prerequisite: *M.E. 22.* Second semester.

M.E. 14. Mechanical Engineering Laboratory (2)

Testing of steam engines, turbines, air compressors, and refrigeration equipment, supplemented by lectures on laboratory procedure and topics of general interest in mechanical engineering. Prerequisite: *M.E. 23.* First semester.

M.E. 15. Thesis (3)

Candidates for the degree of B.S. in M.E. may, with the approval of the department staff, undertake a thesis as a portion of the work during the senior year.

M.E. 16. Applied Mechanics (3)

Properties of fluids; statics, kinematics of fluid flow; steady flow, viscosity, dimensional analysis, and dynamic similarity; momentum relations; resistance of immersed bodies; dynamic lift and propulsion; dynamics of incompressible and compressible fluids; viscous fluids; lubrication; mathematical study of fluid motion, two-dimensional motion, velocity potential, pressure distribution. Prerequisites: *Mech. 2 and Math. 14 previously or concurrently.* First semester. (Discontinued 1948-1949.)

M.E. 18. Internal Combustion Engine Laboratory (2)

Testing of spark ignition and compression ignition engines; experimental determination of optimum carburetion and ignition timing; determination of automotive vehicle performance and economy. Inspection trips to industrial plants. Prerequisite: *M.E. 23.* Second semester.

M.E. 19. Mechanical Engineering Laboratory (1)

Testing of mechanical engineering equipment. Prerequisite: *M.E. 29 or equivalent.* First and second semesters.

M.E. 21. Mechanical Engineering Laboratory (1)

Instruments, fluid flow, heat transfer. Prerequisite: *M.E. 22.* First semester.

M.E. 22. Thermodynamics (3)

Energy, stored and in transition; steady flow and nonflow equations and applications; reversible cycles; Carnot principle; fundamental temperature scale; entropy; properties of liquids, vapors, gases, and mixtures. Prerequisites: *Math. 13, Phys. 23.* First semester.

M.E. 23. Thermodynamics (3)

Continuation of M.E. 22. Flow of elastic fluids through nozzles and orifices; cycles; the steam power plant; internal combustion engines; compressors; refrigeration. Prerequisite: *M.E. 22.* Second semester.

M.E. 25. Mechanical Engineering Laboratory (1)

Continuation of M.E. 21. Tests on steam engines, turbines, compressors, refrigeration equipment, internal combustion engines. Second semester.

M.E. 29. Heat Power (3)

Fuels; combustion; principles of engineering thermodynamics; properties of steam; steam power plant equipment and cycles; internal combustion engines. Prerequisites: *Math. 13, Phys. 23.* First and second semesters.

M.E. 33. Thermodynamics (2)

Energy, stored and in transition; the steady flow equation and its applications; the energy equation for non-flow processes; reversible cycles; the Carnot principle; the fundamental temperature scale; entropy; properties of liquids, vapors, gases, and mixtures. Prerequisite: *M.E. 6, Math. 13.* First semester. (Discontinued 1948-1949.)

M.E. 34. Thermodynamics (3)

Continuation of M.E. 33. Flow of elastic fluids through nozzles and orifices; particular processes; machines; cycles; the steam power plant; internal combustion engines; compressors; refrigeration. Prerequisite: *M.E. 6, Math. 13.* Second semester. (Discontinued 1948-1949.)

M.E. 36. Thermodynamics (3)

A one-semester course, consisting of two recitations and one laboratory period, condensed from M.E. 33 and M.E. 34. Primarily for industrial engineering students. Prerequisite: *M.E. 6, Math. 13.* First semester. (Discontinued 1948-1949.)

M.E. 39. Elementary Machine Design (3)

A study of the kinematic principles in mechanisms and their application in machines. Prerequisites: *C.E. 3, Math. 12, Phys. 22.* First and second semesters.

M.E. 40. Machine Design (3)

Application of the principles of statics, dynamics, strength of materials, and kinematics to the design of machine elements. Prerequisites: *Mech. 11, M.E. 3.* First and second semesters.

For Advanced Undergraduates and Graduates

M.E. 100. Theoretical Naval Architecture (3)

Ship lines, displacement, buoyancy, stability, coefficients; Froude's law of model testing; Taylor's standard series; speed and power of ships. Prerequisite: *senior standing in engineering.* Messrs. Stuart, Sweeney

M.E. 114. Engineering Laboratory (2)

Comprehensive tests of power plant equipment, internal combustion engines, refrigeration machinery. Prerequisite: *M.E. 10.* First semester. (Discontinued 1948-1949.)

M.E. 116. Mechanics of Compressible Fluids (3)

Study of the behavior of compressible fluids; laminar and turbulent flow with boundary layer considerations; thermodynamic and dynamic analysis of flow of fluids, including discussion of Rayleigh and Fanno processes. Prerequisites: *M.E. 23, Mech. 21.* Mr. Jackson

M.E. 117. Air Conditioning and Refrigeration (3)

Development of the theories of air conditioning, refrigeration, heating and ventilating, with study of typical systems. Prerequisite: *M.E. 23.* Messrs. Klein, Sweeney

M.E. 118. Engineering Laboratory (2)

Continuation of M.E.114, supplemented by complete tests of power plants in the vicinity and original investigations. Prerequisite: *M.E. 10.* Second semester. (Discontinued 1948-1949.)

M.E. 119. Theoretical Aeronautics (3)

Aerodynamics of the airplane and propeller; performance of airplanes; stability and control. Prerequisite: *M.E. 116.* Mr. Jackson

M.E. 121. Advanced Machine Design (3)

Vibration and balancing of machines; detailed design based on consideration of dynamic loading and fatigue. Prerequisite: *M.E. 40.* First semester. Messrs. Bates, Hartman

M.E. 122. Advanced Machine Design (3)

Project work on the design of a complete machine and study of adaptability of design to manufacturing considerations. Prerequisite: *M.E. 40.* Second semester. Messrs. Bates, Hartman

M.E. 123. Power Plants (3)

Study of the relation of the various pieces of power plant equipment to each other; calculations for the design of power plant elements; comparison of different types of plants driven by both steam and internal combustion engines; utilization of exhaust heat. Prerequisite: *M.E. 23.* First semester. Messrs. Klein, Stuart

M.E. 124. Applied Thermodynamics (3)

Selected application of thermodynamics to problems encountered in engineering practice. Prerequisite: *M.E. 23.* Mr. Stuart

M.E. 125. Air Conditioning and Refrigeration (3)

Advanced work in the field of air conditioning and refrigeration: study of automatic temperature and humidity control; design of typical systems, with emphasis on use of the ASH&VE *Guide.* Prerequisite: *M.E. 117.* Messrs. Jackson, Sweeney

M.E. 126. Airplane Structural Analysis (3)

Study of design procedure; application of structural theory and methods of theoretical and experimental stress analysis to airplane structural components. Prerequisites: *M.E. 116, 121.* Second semester. Mr. Hartman

M.E. 127. Stress Analysis for Design (3)

Analytical and experimental methods of stress analysis applied to complex machine elements; experimental determination of proper distribution of material in highly stressed parts. Prerequisites: *M.E. 40, Math. 106.* First semester. Messrs. Bates, Hartman

M.E. 129. Elementary Mechanical Vibration Analysis (3)

Analysis of physical systems and setting up equations; development of significant engineering relationships. Emphasis on engineering application. Prerequisite: *Math. 106.* First semester. Messrs. Bates, Hartman

M.E. 134. Plant Proseminar (1)

Proseminar covering the material of M.E. 114. Concerned primarily with trips to industrial plants and discussions of mechanical processes and equipment. Prerequisite: *M.E. 10.* First semester. (Discontinued 1948-1949.)

M.E. 138. Plant Proseminar (1)

Continuation of M.E. 134 but covering the material of M.E. 118. Prerequisite: *M.E. 10.* Second semester. (Discontinued 1948-1949.)

M.E. 144. Internal Combustion Engines (3)

Thermodynamics of internal combustion engine cycles; theory of spark ignition engines, Diesel engines, gas turbines and jet-propulsion; carburetion, fuel injection, supercharging. Prerequisite: *M.E. 23.* Second semester. Mr. Jackson

For Graduates

Subject to proper approval, a graduate major in mechanical engineering may include courses chosen from the following group: Math. 217 and 218, Theory of Elasticity; Math. 229 and 230, Advanced Analytic Mechanics; C.E. 212, Research Methods; C.E. 218, Structural Metals; Mech. 201, Advanced Analytical Mechanics.

M.E. 200. Advanced Thermodynamics (3)

Critical review of first and second laws, entropy, and general thermodynamic equations and relations; applications to current problems in technology and research, including properties of fluids, chemical equilibrium, combustion, stable and metastable states, and flow processes. First semester. Mr. Stuart

M.E. 201. Advanced Thermodynamics (3)

Continuation of M.E. 200. Second semester. Mr. Stuart

M.E. 203. Internal Combustion Engines (3)

History; laws of mixing, carburetion, atomization, combustion, and chemical equilibrium; heat losses; friction losses; governing; gas engine cycles; vibration and balancing; engine types. Prerequisite: *graduate standing in engineering.* First semester. Mr. Jackson

M.E. 204. Internal Combustion Engines (3)

Continuation of M.E. 203. Prerequisite: *graduate standing in engineering.* Second semester. Mr. Jackson

M.E. 207. Steam and Gas Turbines (3)

Theory of the steam turbine, gas turbine and steady flow compressors; discussion of types and cycles; application to stationary, marine, and aircraft installation; jet-propulsion. Prerequisite: *graduate standing in engineering.* Second semester. Mr. Stuart

M.E. 208. Steam and Gas Turbines (3)

Continuation of M.E. 207. Prerequisite: *graduate standing in engineering.* Second semester. Mr. Stuart

M.E. 211. Advanced Mechanical Engineering Laboratory (3)

The planning, design, execution and reporting of experimental tests and investigations in mechanical engineering. Prerequisite: *adequate preparation in thermodynamics and laboratory courses.* First semester.
Mr. Sweeney

M.E. 212. Advanced Mechanical Engineering Laboratory (3)

Continuation of M.E. 211. Second semester. Mr. Sweeney

M.E. 216. Aero-Thermodynamics (3)

Behavior of compressible fluids, including study of completely immersed bodies such as airfoils and turbine and compressor blades; heat transfer as affected by fluid flow. Mr. Jackson

M.E. 217. Experimental Methods in Aerodynamics (3)

Theory, design, and analysis of wind tunnels; visualization measurement and photography of fluid motion, especially of turbulence and velocity distribution; statistical methods and experimental work in stria-photography. (Not offered 1949-1950.)

M.E. 220. Advanced Mechanical Vibration Analysis (3)

Systems of more than one degree of freedom, stability, self-induced vibrations, harmonic analysis, alternative theoretical methods, vibration of elastic solids. Second semester. Messrs. Bates, Hartman

M.E. 230. Special Problems in Mechanical Engineering (3)

A course for well qualified students whose experience has indicated a need for study of a specialized nature in mechanical engineering theory or design. Prerequisite: *consent of departmental adviser and instructor.* First or second semester.

Messrs. Bates, Hartman, Jackson, Stuart, Sweeney

INDUSTRIAL ENGINEERING

I.E. 1. Industrial Employment

Following the junior year, students in the industrial and mechanical engineering curricula are required to do a minimum of eight weeks of practical work, preferably as student apprentices, in the work they plan to follow after graduation. A report, typewritten and bound, is required. Prerequisite: *sophomore standing.*

I.E. 2. Industrial Management (3)

A course in the essential problems of organization and management of industrial enterprises. Planned for students other than those in mechanical and industrial engineering. Prerequisites: *Eco. 3, 4.* First semester.

I.E. 3. Industrial Management (3)

Continuation of I.E. 2. Prerequisites: *Eco. 3, 4.* Second semester.

I.E. 5. Thesis (3)

Candidates for the bachelor's degree in industrial engineering may, with the approval of the department staff, undertake a thesis as a portion of the work of the senior year.

I.E. 13. Elementary Industrial Engineering (3)

The development of modern industry and its components, with attention to the engineering, economic, and personnel problems. Lectures, problem exercises, trips and collateral reading. Prerequisite: *sophomore standing.* First and second semesters.

I.E. 14. Industrial Administration (3)

The physical plant, its organization, location, layout, and operation. Lectures, problem exercises, trips, and collateral reading. Prerequisite: *I.E. 13.* First semester.

I.E. 15. Personnel Administration (3)

The personnel, their selection, training, care, and reward. Lectures, problem exercises, trips and collateral reading. Prerequisite: *I.E. 13.* Second semester.

For Advanced Undergraduates and Graduates

I.E. 111. Industrial Administration (3)

The physical plant, its organization, location, layout, and operation. Lectures, problem exercises, trips, and collateral reading. Prerequisite: *I.E. 13.* First semester. (Discontinued 1948-1949.)

I.E. 112. Personnel Administration (3)

The personnel, their selection, training, care and reward. Lectures, problems exercises, trips, and collateral reading. Prerequisite: *I.E. 13.* Second semester. (Discontinued 1948-1949.)

I.E. 121. Experimental Industrial Engineering (3)

Experimental projects in selected fields of industrial engineering, approved by the instructor. A written report is required. Prerequisite: *senior standing in industrial engineering and consent of the instructor.*
Mr. Holme

I.E. 122. Experimental Industrial Engineering (3)

Continuation of I.E. 121. Prerequisite: *senior standing in industrial engineering and consent of the instructor.* Mr. Holme

I.E. 125. Production Control (3)

The coördination of an industry's activities to produce its commodities in sufficient quantity, of proper quality, and at the right time, for the least possible cost. Lectures, problem exercises, trips, and term project. Prerequisite: *I.E. 14 and senior standing.* First semester.
Messrs. Beauchamp, Gould

I.E. 126. Quality Control (3)

Industrial inspection methods; interpretation of results, based upon statistical techniques for improvement of product quality, for better coördination between design, production, and inspection, and for reduction of cost. Lectures, problem exercises, trips, and term project. Prerequisites: *I.E. 14, Math. 131, and senior standing.* Second semester.
Messrs. Beauchamp, Gould

I.E. 127. Product Engineering (3)

The relationship and application of modern industrial processes, materials, and machines to product design for improvement of production, efficiency, product life, and consumer acceptance. Lectures, problem exercises, trips and term project. Prerequisites: *I.E. 14, senior standing, and consent of the instructor.* First semester. Mr. Ramberg

I.E. 128. Work Simplification (3)

Process and product simplification, involving method study, time study, and other analysis techniques. Lectures, problem exercises, trips, and term project. Prerequisites: *I.E. 14 and 15, and senior standing.* Second semester. Messrs. Holme, Ramberg

I.E. 129. Wage and Salary Administration (3)

The theory and practice of job evaluation, employee merit rating, and community wage surveys for the purpose of establishing salary levels which provide proper payment for various jobs, reward individual effort and merit, and meet competition. Prerequisites: *I.E. 15 and senior standing.* First semester. Messrs. Fay, Gould

I.E. 130. Industrial Relations (3)

The policies, organization, and operation of an industrial relations department, based upon existing governmental regulations and current policies of organized labor. Lectures, problem exercises, trips, and term project. Prerequisites: *I.E. 15, Eco. 133, and senior standing.* Second semester. Mr. Holme

For Graduates

Candidates for the degree of Master of Science with a major in industrial engineering shall include courses on the "200" level to the extent of a minimum of six hours in industrial engineering and a minimum of six hours in other branches of engineering. The major may include Psych. 205 and 206, Seminar in Applied Psychology. Collateral courses shall be confined to engineering, business, and psychology.

I.E. 200. Management Policies (3)

Analysis of the factors entering into the determination of management policies; discussion of case material bearing upon the organization, location, growth, size, socialization, and control of types of industries. First semester. Mr. Holme

I.E. 201. Personnel Policies (3)

Analysis of the factors entering into the determination of personnel policies; discussion of case material bearing on the worker and his relation to industry. Second semester. Mr. Holme

MECHANICS

See Civil Engineering

METALLURGICAL ENGINEERING

Professors Doan and Butts
Associate Professors Stout and W. Beck
Assistant Professor Libsch
Messrs. Kerr and J. H. Gross

Met. 1. Introduction to Metallurgy (3)

Preliminary study of materials, apparatus, and types of processes used in the metallurgical industry; fuels and combustion; roasting, smelting, refining; ores, slags; furnaces, refractories, metal working and testing; pyrometry; welding. Lectures, problems, laboratory exercises, plant visits. Prerequisites: *Chem. 4, or Chem. 15 and 16;* Chem. 5; Phys. 22, or Phys. 12 and 16. First semester.

Met. 2. Metallurgy of Iron and Steel (2)

Same as Met. 52, but without plant visits or laboratory exercises. Prerequisite: Met. 1 or 21. Second semester.

Met. 3. Metallurgy of Copper, Lead, and Associated Metals (2)

Same as Met. 53, but without plant visits or laboratory work. Prerequisite: Met. 1 or 21. First semester.

Met. 21. Engineering Metallurgy (2)

An abridgment of Met. 1, 52, 53, and 54, especially adapted to the viewpoint of users of metals. Prerequisites: Chem. 4, 5; Phys. 22. First and second semesters.

Met. 33. Metallurgical Laboratory (1)

The internal structure and properties of metals and industrial alloys; effect of cold working and heat treatment; welding; pyrometry, hardness testing, ageing. Prerequisites: *Met. 1 or 21, previously or concurrently;* Phys. 23, 24. First semester.

Met. 34. Metallurgical Laboratory (1)

Continuation of Met. 33. Prerequisites: *Met. 1 or 21, previously or concurrently;* Met. 33; Phys. 23, 24. Second semester.

Met. 49. Summer Work

At the end of the junior year students in the curriculum of metallurgical engineering are required to secure in industrial plants at least eight weeks practical experience.

Met. 52. Metallurgy of Iron and Steel (3)

Chemical and physical properties of iron and steel; manufacturing processes. Lectures and daily questions on text book, plant visits, and laboratory exercises. Prerequisites: Met. 1 or 21. Second semester.

Met. 53. Metallurgy of Zinc, Aluminum, and the Minor Metals (3)

Production processes and properties of copper and its alloys, lead and its alloys, gold, silver, platinum, selenium and tellurium, bismuth. Lectures, written exercises on text book assignments, and laboratory work, with formal written reports thereon. Two- or three-day inspection trip (expense about $10.00) is required. Prerequisite: *Met. 1 or 21.* First semester.

Met. 54. Metallurgy of Zinc, Aluminum, and the Minor Metals (2)

Production processes and properties of aluminum and its alloys, zinc, tin, nickel, gold, silver, mercury, antimony, etc. A one-day inspection trip (expense about $3.00) is required. Prerequisite: *Met. 1 or 21.* Second semester.

Met. 62. Problems in Iron and Steel Metallurgy (1)

A course of problems, involving the fundamental principles of the various processes in the metallurgy of iron and steel, to give the student an understanding of the quantitative relationships in the processes. Prerequisites: *Met. 52 or 21, previously or concurrently; Met. 1 or 81.* Second semester.

Met. 78. Corrosion Problems (1)

Introduction to the science and engineering of metallic corrosion; discussion of actual corrosion problems. Prerequisites: *Chem. 5;* Met. 1 or 21. First semester.

Met. 81. Short Course in Metallurgical Engineering Problems (1)

An abridgment of the problem work of Met. 1 and 62. Prerequisites: *Chem. 4, Met. 21, previously or concurrently;* Chem. 5. First and second semesters.

Met. 91. Thesis in Metallurgy (3)

Candidates for the bachelor's degree in metallurgical engineering may, with the approval of the head of the department, undertake a thesis as a portion of the work during the senior year. First or second semester.

For Advanced Undergraduates and Graduates

Met. 108. Electrometallurgy (3)

The practical application of electricity to metallurgical processes; electroplating and electric furnace plants and practice. Lectures and laboratory work. Prerequisites: *Met. 1 or 21;* Met. 125. Second semester. Mr. Butts

Met. 125. Electrochemistry and Electrometallurgy (2)

Lectures and recitations concerning current and voltage in electrolysis, energy relations, electrode reactions, primary cells and storage batteries, electric furnaces, and practical applications of electricity to metallurgical processes. Prerequisites: *Chem. 5, Met. 1 or 21;* Phys. 24. First semester. Mr. Butts

Met. 130. Physical Metallurgy (3)

The states of matter; physical structure and constitution of metals; X-rays and crystal structure; effect of mechanical working, heat treatment and composition; casting, shaping, welding, and testing metal objects. Lectures and laboratory work. Prerequisites: *Chem. 5, Phys. 22;* Met. 1 or 21. Second semester. Mr. Doan

Met. 131. Metallography (3)

Internal structures of alloys and the constitutional diagram; the relation between structure and properties in industrial alloys; quenching and aging. Lectures, problems, and laboratory experiments. Prerequisites: *Chem. 5, Phys. 22;* Met. 1 or 21, and 130. First semester. Mr. Doan

Met. 135. Electrochemical Laboratory (1)

Quantitative relations in the deposition of metals by electrolysis; experimental study of the conditions controlling the nature of electrolytic deposits, electrolysis of fused salts, cathodic and anodic reactions. Prerequisites: *Chem. 5, Met. 1 or 21,* Phys. 24; Met. 125, previously or concurrently. First semester. Mr. Butts

Met. 138. Metallurgical Colloquium (2)

An opportunity for the student to develop (1) an acquaintance with the current metallurgical literature, (2) the ability to interpret it clearly, and (3) skill in presenting oral engineering reports. Prerequisites: *Met. 1 or 21;* Met. 52 and 130. First semester. Mr. Doan

Met. 152. Advanced Metallurgy of Iron and Steel (3)

Continuation of Met. 52, for seniors and graduate students. Lectures, plant visits, laboratory exercises, written reports. Prerequisite: Met. 52. Second semester. Mr. Stout

Met. 163. Problems in the Metallurgy of Copper, Lead, Gold, and Silver (1)

A course of problems concerned with the principles utilized in the metallurgy of copper, lead, silver, and gold. Prerequisites: *Met. 1 or 81; Met. 53 previously or concurrently;* Met. 62. First semester. Mr. Butts

Met. 164. Problems in the Metallurgy of Zinc, Aluminum, and the Minor Metals (1)

A course of problems concerned with the principles utilized in the metallurgy of zinc, aluminum, etc. Prerequisites: *Met. 1 or 81; Met. 54 previously or concurrently;* Met. 62 and 163. Second semester. Mr. Butts

Met. 175. Elective Projects in Metallurgy (2)

An opportunity for the advanced student to undertake an independent investigation in a metallurgical field of his own choice. Assistance will be given only when the student requests it. The project may be either a comprehensive literature investigation, a theoretical study, or one involving laboratory experiment. The project must receive approval of the department before work is begun. First and second semesters.

Messrs. Butts, Doan, Libsch, Stout

For Graduates

NOTE. Not all of the courses listed below will be given in any one year. Those to be given will be determined by the number of applicants at the beginning of the semester; if the number is less than six, the course may be omitted.

Chem. 236 and 237, X-ray Research, may be included in a graduate major in metallurgy.

Met. 201. Metallurgical Investigation and Thesis (4-6)

Investigation of some special metallurgical problems, such as an improvement or innovation in some metallurgical process, the establishment of an equilibrium diagram, the effect of heat treatment on a metal or alloy; study of the literature. The study and investigation must be embodied in a written report. Prerequisite: undergraduate metallurgical courses in the field of the investigation. First and second semesters.
Messrs. Butts, Doan, Libsch, Stout

Met. 202. Metallurgical Investigation and Thesis (3)

Continuation of Met. 201. First and second semesters.
Messrs. Butts, Doan, Libsch, Stout

Met. 203. Advanced Electrometallurgy (3)

Specialized study in some particular field of electrochemistry or electrometallurgy selected by the student, such as electrode reactions, thermodynamics of electrolysis, electroplating, electrolytic refining, electrothermics, electrothermal efficiencies, industrial processes. Prerequisite: Met. 125. First and second semesters. Mr. Butts

Met. 205. Non-ferrous Metallurgy (3)

Detailed study of the metallurgy of any one or more of the non-ferrous metals, including historical evolution, reading of references on modern practices, and theoretical consideration of the possibilities of future development in manufacture or use. Both chemical and physical metallurgy of the alloys may be included. Prerequisite: a course in non-ferrous metallurgy. First or second semester. Mr. Butts

Met. 208. The Phase Rule (3)

Heterogeneous equilibria in binary and ternary alloy systems in the light of the phase rule; construction and interpretation of ternary constitutional diagram models. Prerequisites: Met. 131; facility in reading German. First or second semester. Mr. Doan

Met. 210. The Physical Chemistry of the Metals (3)

The principle fields of physical chemistry in their relation to the extraction of metals from their ores; the refining, alloying, heat treatment, welding, coating and corrosion of metal systems. Prerequisites: one undergraduate course in physical chemistry; elementary ferrous or non-ferrous metallurgy, or Met. 130 and 131; facility in reading German. First or second semester. Mr. Stout

Met. 211. The Principles of Modern Welding (3)

The foundations in scientific principle upon which the welding processes rest; the present limitations of the various processes; the trends in new developments; the engineering, industrial, and commercial aspects of welding. Prerequisites: Met. 130 and 131. First or second semester.
Mr. Doan

Met. 212. Radiography in Principle and Practice (3)

The principles of radiography; X-rays and gamma rays; industrial practices. Prerequisites: Phys. 122, Met. 130. First or second semester. Mr. Doan

Met. 215. Stainless Steels (3)

Special problems relating to the making, rolling, finishing, fabricating, and welding of corrosion-resistant and heat-resistant alloys of iron with chromium and additional alloying elements commonly used; equilibrium diagrams of iron and chromium with and without other elements sometimes added to stainless steel, such as nickel, molybdenum, etc; the properties of the different typical alloys and their uses in industry and modern civilization. Prerequisites: ferrous metallurgy and, previously or concurrently, Met. 130, 131, and 152. First or second semester. Mr. Stout

Met. 219. Alloy Steels (3)

Alloy steels other than chromium and nickel, especially alloys with manganese, silicon, molybdenum, vanadium, tungsten; high speed steels; steels for electromagnets and permanent magnets; ternary and quaternary alloy steels for heat treating, especially for automotive, airplane, and special machinery parts. Prerequisites: ferrous metallurgy; and, previously or concurrently, Met. 130, 131, and 152. First or second semester. Mr. Stout

Met. 221. Surface Treatment of Metals (3)

Study of metallic surfaces, primarily steel; preparation of surfaces by machining, grinding, polishing; methods of surface hardening; corrosion and surface protection of metals; analysis of surface stresses as related to fatigue life. First semester. Mr. Libsch

Met. 222. Corrosion of Metals (3)

Theory of the corrosion of metals and technical applications. Discussion of the fundamental laws of electrochemistry as applied to corrosion processes; selected cases of corrosion in the atmosphere, on ships and aircraft, railroads, and underground pipes and cables. Special attention to corrosive attack on welded structures and vibrating machine parts and to corrosion cracking. Prerequisites: *elementary metallurgy and one undergraduate course in physical chemistry;* Met. 125 or Chem. 194, Met. 130. Second semester. Mr. Beck

Met. 223. Powder Metallurgy (3)

A study of the powder metallurgy processes for forming metal parts. Discussion of metal powder production and characteristics, plastic deformation and bonding associated with pressing, the mechanism of sintering, and the nature of the sintered product; preparation of sintered alloy compacts; application of the process to special industries. Prerequisites: Met. 52, 53, 54, 130, 131, or equivalents. Mr. Libsch

MILITARY SCIENCE AND TACTICS

Colonel Luckett
Lieutenant Colonels Mulholland and Beach
Major Hoerner
Captains Emrick, Onila, and Soverns
Lieutenants Schreiner and Clark
Master Sergeants Joines, Brubeck, Bereznak, Hartenstine,
Moody, Rutkoski, and Boris
Technical Sergeants Stone and McVicar
Sergeant Murphy

An infantry unit of the Reserve Officer's Training Corps was established at Lehigh University in September, 1919, an ordnance unit in September, 1925, an air force unit in October, 1946, and an engineer unit in September, 1947. The military courses are conducted under Department of the Army and Department of the Air Force regulations, and consist of four semesters of basic work common to both departments of the service, and two years of advanced work along specialized lines.

By action of the trustees and faculty of the University, the two-year course in basic military science and tactics is required for graduation with a baccalaureate degree. Those students who have served three months or more in any branch of the armed forces of the United States between September, 1940 and January 25, 1948, a date marking six months beyond the end of World War II, are relieved of this requirement and are neither required nor expected to substitute academic work therefor. On recommendation of the director of the Student's Health Service, a student may also be exempt by reason of physical disability. Members of the University band are relieved of one semester of basic military science for each semester of satisfactory service in the band. Students transferring from other institutions may be exempt from part or all of the required number of hours in military science, depending upon the amount of advanced standing allowed at the time of their admission.

Qualified students may carry on the advanced program, with a commission as Second Lieutenant in the Officers Reserve Corps as the objective. To be eligible for admission to the advanced work, a student must be from 19 to 26 years of age, must have completed the basic courses in military science or have had active service in the armed forces for one year, and must pass a physical examination. The approval of the professor of military science and tactics and the president of the University is also required for admission to all advanced courses. Enrollment in an undergraduate engineering curriculum accredited at the institution by the Engineers Council for Professional Development is a prerequisite for Advanced Engineering. For admission to Advanced Ordnance, enrollment in an academic course of instruction leading to an engineering, technical, or scientific degree is required. A requirement for admission to Advanced Air Force for those who wish to concentrate on the communications phase is enrollment in an academic course leading to an electrical engineering degree or a scientific degree in an electrical field. All students taking the advanced courses are required to attend summer camp.

Uniforms and equipment are furnished by the Government to basic students, but each student must provide suitable socks and shoes. A cash deposit of $25.00 is required, payable at the time of registration and refunded in full upon the return of the property issued by the department. Students in advanced work receive a uniform and a subsistence allowance.

Basic Courses

Mil. 1. Basic Course, First Semester (2)

Fundamental military training common to all arms and services: theoretical and practical instruction in individual weapons and rifle marksmanship; National Defense Act and ROTC; leadership, drill and exercise of command. Two recitations and two hours of drill a week. First semester.

Mil. 2. Basic Course, Second Semester (2)

Fundamental military training common to all arms and services: theoretical and practical instruction in leadership, drill, and exercise of command; military organization; hygiene and first aid; maps and aerial photographs. Two recitations and two hours of drill a week. Second semester.

Mil. 3. Basic Course, Third Semester (2)

Fundamental military training common to all arms and services: theoretical and practical instruction in leadership, drill, and exercise of command; physical development methods; maps and aerial photographs; military law and boards. Two recitations and two hours of drill a week. First semester.

Mil. 4. Basic Course, Fourth Semester (2)

Fundamental military training common to all arms and services: theoretical and practical instruction in leadership, drill, and exercise of command; military administration; evolution of warfare. Two recitations and two hours of drill each week. Second semester.

Advanced Courses

Mil. 5. Advanced Infantry, First Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; military law and boards; tactics and technique of the infantry, including communications, gunnery, technique of fire and fire control, motors and transportation, and organization. Four recitations and two hours of drill a week. First semester.

Mil. 6. Advanced Infantry, Second Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; geographical foundations of national power; tactics and technique of the infantry, including tactics, the military team, and troop movements. Four recitations and two hours of drill a week. Second semester.

Mil. 7. Advanced Infantry, Third Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; command and staff; military teaching methods; tactics and technique of the infantry, including communications, gunnery, technique of fire and fire control, supply and maintenance, and troop movements. Four recitations and two hours of drill a week. First semester.

Mil. 8. Advanced Infantry, Fourth Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; military problems of the United States; military mobilization and demobilization; combat intelligence; psychological warfare; tactics and technique of the infantry, including tactics and new developments. Four recitations and two hours of drill a week. Second semester.

Mil. 15. Advanced Ordnance, First Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; geographical foundations of national power; military law and boards; tactics and technique of the Ordnance Department, including artillery materiel, place of Ordnance in the military team, small arms materiel, and ammunition materiel. Four recitations and two hours of drill a week. First semester.

Mil. 16. Advanced Ordnance, Second Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; tactics and technique of the Ordnance Department, including ammunition supply, maintenance and supply procedures, fire control materiel, organization of the Ordnance Department, and automotive materiel. Four recitations and two hours of drill a week. Second semester.

Mil. 17. Advanced Ordnance, Third Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; military teaching methods; military problems of the United States; command and staff; tactics and technique of the Ordnance Department, including automotive materiel, small arms materiel, artillery materiel, maintenance and supply procedures, ammunition materiel, ammunition supply, and fire control materiel. Four recitations and two hours of drill a week. First semester.

Mil. 18. Advanced Ordnance, Fourth Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; psychological warfare; military mobilization and demobilization; combat intelligence; command and staff; tactics and technique of Ordnance Department, including a materiel specialty to be chosen by each student. The materiel specialty may be any one of the following: artillery, small arms, ammunition, fire control instruments, or automotive. Four recitations and two hours of drill a week. Second semester.

Mil. 35. Advanced Air Force, First Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; military law and boards; geographic foundations of national power; tactics and technique of the Air Force, including history of and organization of the AF; AF training, AF inspection system, and AF statistical control. Four recitations and two hours of drill a week. First semester.

Mil. 36. Advanced Air Force, Second Semester (3)

Theoretical and practical instruction in leadership, psychology, and personnel management; leadership, drill, and exercise of command; tactics and technique of the Air Force, including air intelligence and combat orders; Air Force supply; transportation, navigation, aeronautics, communications, meteorology, guided missiles, and air operations. Four recitations and two hours of drill a week. Second semester.

Mil. 37. Advanced Air Force, Third Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; command and staff; military teaching methods; military problems of the United States; military mobilization and demobilizaton; tactics and technique of the Air Force, including combat intelligence, introduction to Air Force communications administration, radio communications (general), aircraft radio, and visual communications. Four recitations and two hours of drill a week. First semester.

Mil. 38. Advanced Air Force, Fourth Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; command and staff; military teaching methods; psychological warfare; tactics and technique of the Air Force, including communications supply and maintenance, ground radio, survey of radar and wire communications. Four recitations and two hours of drill a week. Second semester.

Mil. 45. Advanced Engineering, First Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; military law and boards; tactics and technique of the Corps of Engineers, including organization of Engineer units, the place of the Engineers in the military team, job management, and engineer combat principles. Four recitations and two hours of drill a week. First semester.

Mil. 46. Advanced Engineering, Second Semester (3)

Theoretical and practical instruction in military leadership, psychology, and personnel management; leadership, drill, and exercise of command; geographical foundations of national power; tactics and technique of the Corps of Engineers, including engineer reconnaissance, bridge design and classification, camouflage, military roads, organization of ground and field fortifications, military sketching, and explosives and demolitions. Four recitations and two hours of drill a week. Second semester.

Mil. 47. Advanced Engineering, Third Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; military teaching methods; military problems of the United States; combat intelligence; tactics and technique of the Corps of Engineers, including engineer estimates and orders, engineer combat principles, engineer reconnaissance, and river crossing operations. Four recitations and two hours of drill a week. First semester.

Mil. 48. Advanced Engineering, Fourth Semester (3)

Theoretical and practical instruction in leadership, drill, and exercise of command; command and staff functions; military mobilization and demobilization; psychological warfare; tactics and technique of the Corps of Engineers, including airborne and amphibious operations, construction and utilities, engineer signal communications, engineer supply and water supply. Four recitations and two hours of drill a week. Second semester.

MINING ENGINEERING

Professor Callen
Associate Professor Gallagher

MINING ENGINEERING

Min. 6a. Mine Surveying (2)

Methods of underground surveying; note forms; determination of true meridian and latitude; methods of carrying meridian underground through tunnels, slopes, and shafts; problems on mineral land and mine surveying. Prerequisite: *C.E. 6a.* Second semester.

Min. 10. Fuel Technology (2)

Solid fuels: sampling; proximate and ultimate composition of coals, calorific values, fusibility of ash; classification of coal; carbonization and gasification of fuel. Prerequisite: *one year of college chemistry.* First semester.

Min. 12. Fuel Technology Laboratory (1)

Coal and gas analysis; calorimetry. Prerequisites: *Chem. 37 and 47 or equivalent; Min. 10 concurrently.* First semester.

Min. 15. Mining Engineering (3)

A survey of the elements of mining engineering for students in curricula other than mining engineering. Prospecting, boring, excavation, support, mining methods, mineral preparation. Prerequisite: *junior standing.* Second semester.

Min. 16. Mine Surveying, Field Work (2)

Practice in surface and underground surveying; calculation of field notes; preparation of mine maps. Eight hours of field and laboratory work at an operating mine each week day for two weeks. Prerequisite: *Min. 6a.* Summer session.

Min. 20. Industrial Employment

Industrial employment in mining or a related field for eight weeks, usually in the summer following the junior year. A written report is required. Prerequisite: *sophomore standing.*

Min. 21. Mining Fundamentals (3)

Methods of prospecting; drilling, explosives, and blasting; tunneling, slope and shaft-sinking; support of workings; machines for cutting and loading. Prerequisites: *Geol. 1, Math. 13, Phys. 24;* Mech. 11 concurrently. First semester.

Min. 22. Methods of Mining (3)

The methods of working bedded and vein deposits, with special attention to principles involved in the selection of a mining method and to mechanization. Prerequisite: *Min. 21.* Second semester.

For Advanced Undergraduates and Graduates

Min. 103. Mine Ventilation (3)

A study of mine atmospheres and of gases produced or encountered in mining operations; distribution and control of the ventilating current to meet requirements of safe and efficient operation; mine fires and explosions. Prerequisites: *Min. 22 and Mech. 21.* First semester. Mr. Callen

Min. 104. Haulage, Hoisting, and Pumping (3)

The fundamentals of basic design, selection, and application of equipment for transportation of mineral products from working face to surface plant; sources, control, and disposal of mine water. Prerequisites: *Min. 22, Mech. 11, E.E. 60 and M.E. 29.* Second semester. Mr. Callen

Min. 105. Mine Administration (2)

Mining law; mine organization and management; wage systems and trade agreements; mine safety organization and regulation; special aspects of workmen's compensation laws; personnel administration. Prerequisite: *Min. 22.* Second semester. Mr. Callen

Min. 106. Mining Economics (3)

Systematic exploration and examination; theory and methods of sampling; reserves; mine taxation; depreciation and depletion; valuation and reports. Prerequisites: *Acctg. 4, Min. 22 and 107.* First semester.
Mr. Callen

Min. 107. Mineral Preparation (3)

Recovery of minerals from ores; machines and apparatus used for coarse and fine crushing; classifying and preparation for concentration; methods of concentration, including gravity and magnetic methods, flotation, etc.; principles of concentration applied to the preparation of coal. Visits to mills and coal washing plants. Prerequisites: *Geol. 31 or 35, Phys. 23, 24;* Chem. 37, Min. 22. First semester. Mr. Gallagher

Min. 108. Advanced Mineral Preparation (2)

An extension of the study of fundamental theories of mineral preparation begun in Min. 107, with special reference to flotation of metallic and non-metallic minerals; design of flow sheets based on results of laboratory tests. Prerequisite: *Min. 107.* Second semester. Mr. Gallagher

For Graduates

Students desiring to do graduate work in mining engineering should consult with the head of the department with regard to their qualifications.

Min. 211. Mining Research (2-6)

Investigation of a problem in one of the fields of mining engineering: (a) Mining Methods; (b) Mineral Preparation; (c) Mine Ventilation; (d) Mining Economics. First or second semester.
Messrs. Callen, Gallagher

Min. 212. Mining Research (2-6)

A continuation of Min. 211. First or second semester.
Messrs. Callen, Gallagher

Min. 213. Advanced Mining Practice (3-9)

A continuation and amplification of undergraduate work in the major fields of mining engineering. A student may register for one, two, or three of the fields in any one semester: (a) Mining Methods; (b) Mineral Preparation; (c) Mine Ventilation; (d) Mining Economics. First or second semester. Messrs. Callen, Gallagher

Min. 214. Advanced Mining Practice (3-9)

A continuation of Min. 213. First or second semester.
Messrs. Callen, Gallagher

ENGINEERING GEOPHYSICS

Eng. Geop. 101. Geophysical Methods (3)

A treatment of the fundamental principles underlying all geophysical methods; elements of theory and physical principles of instruments; physical properties of rocks and formations and methods of their determination. Prerequisites: *Math. 13, Phys. 24, or 16 and 17; Geol. 1 previously or concurrently.* First semester. Mr. Gallagher

Eng. Geop. 102. Geophysical Applications (3)

A detailed study of the applications of geophysical prospecting to the fields of mining, geology, and engineering. Prerequisite: *Eng. Geop. 101.* Second semester. Mr. Gallagher

Eng. Geop. 103. Seismic and Magnetic Prospecting (3)

Seismic: elements of the theory of elastic deformations and wave propagation; a detailed study of the methods (fan shooting, refraction, and reflection); theory and description of seismographs. Magnetic: magnetic properties of rocks and minerals; theory and description of magnetic instruments; corrections, representations, and results. Prerequisites: *Eng. Geop. 102, Math. 106, Phys. 162.* First semester. Mr. Gallagher

Eng. Geop. 104. Electrical and Gravitational Prospecting (3)

Electrical: the fundamental principles of the electrical prospecting methods—self potential, AC and DC equipotential, resistivity, potential-drop-ratio, electromagnetic and radio; the electrical properties of rocks and minerals; theory and description of equipment and interpretation of results. Gravitational: a treatment of the gravitational principles and methods; pendulum, gravimeter, and torsion balance; the theory and description of gravitational instruments; corrections, interpretation, and results. Prerequisites: *Eng. Geop. 102, Math. 106, Phys. 162.* Second semester. Mr. Gallagher

MUSIC

Assistant Professor Schempf
Mr. Gansz

Mus. 11. Introduction to Music (1)

A course designed for students with little or no experience in music, to stimulate intelligent listening and to develop the ability of recognizing the principal styles, forms, and materials. First semester.

Mus. 12. Introduction to Music (1)

Continuation of Mus. 11. Second semester.

Mus. 13. Introduction to Music Literature (3)

A study of the development of music from the Dark Ages to the early nineteenth century, with emphasis on the significant examples of several styles and composers. This course and its continuation, Mus. 14, are designed for students interested in learning the importance of music in Western civilization. Two one-hour periods each week will be devoted to lectures and one two-hour period to supervised listening to recordings and studying available music. The ability to read music will be an asset, but is not required for admission to these courses. First semester.

Mus. 14. Introduction to Music Literature (3)

Continuation of Mus. 13. A study of music in the nineteenth and twentieth centuries, including contemporary American music. Second semester.

Mus. 17. Basic Musicianship (3)

Review of the fundamentals of music, including keys, clefs, scales, intervals, rhythmic and melodic notation; sight singing, ear training, and composition of melodies with simple harmonization. Emphasis will be placed upon training the ear. Prerequisite: familiarity with bass and treble clefs. First semester.

Mus. 18. Basic Musicianship (3)

Continuation of Mus. 17. Development of ability to write and harmonize simple chorale melodies in the style of Johann Sebastian Bach and to write simple two- and three-part forms. Prerequisite: Mus. 17 or consent of the instructor. Second semester.

Mus. 20. Instrumentation (2)

Study of the instruments of the band and orchestra; practical work in arranging various instrumental combinations. Prerequisite: consent of the instructor. First or second semester.

THE LEHIGH UNIVERSITY BAND

Band may be elected by suitably qualified freshmen and sophomores in lieu of military science and tactics or as volunteers. It is an optional subject for suitably qualified juniors and seniors. The band is drilled according to the methods prescribed for regular army bands by one of the sergeants designated for that purpose by the head of the department of military science and tactics.

The band is required to participate in military ceremonies when called upon by the professor of military science and tactics, and to attend all football games played at home and not more than ten other home games, the latter to be specified by the director of athletics. When it appears for military ceremonies the band is considered an integral part of the R. O. T. C. regiment.

Coat, cap, trousers, and belt of uniform, musical instruments, and music are furnished by the University. A deposit of $25.00 is required from each member of the band for an instrument or uniform.

Students serving in the band receive the following awards: a charm for one year of satisfactory service; for two years of service, a sweater; three years, $20.00 in cash; and four years, an additional $20.00 in cash.

PHILOSOPHY

Chairman F. C. Becker, Professor L. W. Beck
Assistant Professor Ziegler

Phil. 3. Introduction to Philosophy (3)

What philosophy is, the nature of its problems, its relations to other fields of study. An elementary but systematic approach. Textbook, collateral readings, and discussions. First and second semesters.

Phil. 14. Logic and Scientific Method (3)

An introduction to traditional logic; inquiry into the nature of discovery and proof. First and second semesters.

Phil. 15. Ethics: The Theory of Conduct (3)

Ethics as a philosophical discipline; origin and development of moral practices and ideas; analysis of the nature of the good, duty, right, moral judgment, and moral ends; consideration of moral issues in contemporary life. First and second semesters.

Phil. 71. Readings in Philosophy (2 or 3)

A course of readings in any of the various fields of philosophy, designed for the student who has a special interest in work not covered by the regularly rostered courses. Prerequisites: *senior standing and permission of the instructor.* First semester.

Phil. 72. Readings in Philosophy (2 or 3)

Continuation of Phil. 71. Second semester.

Phil. 81. The Organization of Knowledge (3)

A study of the methods, presuppositions, and interrelations of the various fields of knowledge, their present status in our culture, and their contribution to the development of intelligent points of view on contemporary problems. Prerequisite: *senior standing.* First and second semesters.

Phil. 91. Proseminar in Metaphysics (2 or 3)

A study of one or more of the basic problems of philosophy through detailed reading and discussion of some classic in metaphysics. Prerequisite: *Phil. 132 and two additional advanced courses in philosophy.* First semester. (Not offered 1949-1950.)

Phil. 92. Proseminar in Metaphysics (2 or 3)

Continuation of Phil. 51. Second semester. (Not offered 1949-1950.)

For Advanced Undergraduates and Graduates

Phil. 131. Ancient and Medieval Philosophy (3)

From the beginnings of scientific and philosophical reflection in Ionia to the Renaissance. Textbook, selected dialogues of Plato, selections from Aristotle, and other collateral reading. First semester. Mr. Becker

Phil. 132. Modern Philosophy (3)

Continuation of Phil. 131, covering the period to the death of Kant. Textbook, readings in the works of the philosophers studied. Phil. 131 is recommended, but not required, as a prerequisite. Second semester.
Mr. Beck

Phil. 137. Nineteenth Century Philosophy (3)

Continuation of Phil. 132. Prerequisite: *Phil. 132.* First semester. (Not offered 1949-1950.) Mr. Becker

Phil. 138. Twentieth Century Philosophy (3)

Continuation of Phil. 137. Prerequisite: *Phil. 137.* Second semester.
Mr. Becker

Phil. 139. American Philosophy (3)

A study of the chief American philosophers of the eighteenth and nineteenth centuries, and of philosophical problems and aspects of American life and history. The interests of students of American literature and history are especially considered. Prerequisite: *Phil. 132.* First semester. (Not offered 1949-1950.) Mr. Ziegler

Phil. 151. Esthetics (3)

An attempt to reach a consistent, inclusive account of the nature of the esthetic and its place in the life of man and in social organization. Prerequisite: *one course in philosophy.* First semester. (Not offered 1949-1950.) Mr. Becker

Phil. 161. Philosophy of Science (3)

A study of the presuppositions, methods, and implications of the scientific enterprise. Prerequisites: *Phil. 14 or Math. 103, and sufficient background in the natural or social sciences.* Second semester. Mr. Beck

For Graduates

To major in philosophy, graduate students must have completed four undergraduate courses in philosophy or in other ways must satisfy the department that they are qualified to pursue the study of the subject on the graduate level. No student is permitted to register for Phil. 231 or 232, Thesis, unless he has satisfied the head of the department that he has selected a field of research in which he can work effectively and with a considerable measure of independence.

Phil. 201. History of Ancient Philosophy (2 or 3)

First semester. Mr. Ziegler

Phil. 202. History of Medieval Philosophy (2 or 3)

Second semester. Mr. Ziegler

Phil. 205. History of Modern Philosophy (2 or 3)

First semester. Mr. Beck

Phil. 206. History of Modern Philosophy (2 or 3)

Continuation of Phil. 205. Second semester. Mr. Beck

Phil. 211. Special Topics in Philosophy (2 or 3)

Readings, discussions, and reports on selected topics not covered in the regularly rostered courses. May be taken more than once for credit. First semester. Staff

Phil. 212. Special Topics in Philosophy (2 or 3)

Continuation of Phil. 211. Second semester. Staff

Phil. 221. Seminar (2 or 3)

First semester. Staff

Phil. 222. Seminar (2 or 3)

Second semester. Staff

Phil. 231. Thesis (2 or 3)

First semester. Staff

Phil. 232. Thesis (2 or 3)

Second semester. Staff

PHYSICS

Professors Myers, Bayley, and C. W. Curtis
Associate Professors Cheney, Sawyer, and Hyatt
Assistant Professors Bartunek, Havas, Spatz, Emrich, and Wheeler
Messrs. Karas, Hogan, Good, Laponsky, Belmonte, Clifford, Crowe, Crownfield, Hager, King, Langstroth, J. E. Mack, McCrackin, McGinn, McLennan, Rusk, Shreve, Strauss, Weida, and Zaphiropoulos

Phys. 12. Introduction to Physics (3)

A survey course for students in the Colleges of Arts and Science and of Business Administration. A brief introduction to the principal fields of physics. Lecture demonstrations, recitations, and laboratory. First semester.

Phys. 16. General Physics (3)

A continuation of Phys. 12. Lecture demonstrations and recitations. Prerequisite: Math. 1 or 1b; Phys. 12. Second semester.

Phys. 17. General Physics Laboratory (2)

A laboratory course in general physics to accompany Phys. 16. Prerequisites: Math. 1 or 1b; Phys. 12. Second semester.

Phys. 22. Mechanics and Properties of Matter (4)

Introduction to mechanics of solids and fluids; dynamics of point masses and rigid bodies; properties of matter. Two recitations, one lecture, and one laboratory period per week. First and second semesters.

Phys. 23. Heat, Sound, and Light (4)

Wave-motion and sound; heat, with emphasis on the mechanical theory; optics, with emphasis on those portions of interest to technical students. Two recitations, one lecture, and one laboratory period per week. (The calculus is employed in this course.) Prerequisites: *Math. 13 previously or concurrently;* Phys. 22. First and second semesters.

Phys. 24. Electricity and Magnetism (4)

Ohm's law, electric and magnetic fields, electromagnetism, induced electromotive forces, etc. Two recitations, one lecture and one laboratory period per week. The calculus is employed in this course. Prerequisites: *Math. 13, previously or concurrently;* Phys. 22. First and second semesters.

Phys. 50. Industrial Employment

Eight weeks industrial employment during the summer following the junior year, with submission of a written report.

Phys. 61. Laboratory Techniques (1)

Laboratory practices and glass blowing.

For Advanced Undergraduates and Graduates

Phys. 110. Electrical Laboratory (1)

Precise measurements. Prerequisite: *Phys. 24.* First semester.
Mr. Bayley

Phys. 111. Electrical Laboratory (1)

Precise measurements. Continuation of Phys. 110. Prerequisites: *Phys. 24;* Phys. 110. Second semester. Mr. Bayley

Phys. 120. Electric Oscillations and Electric Waves (4)

Electric oscillations and waves and high frequency phenomena. One laboratory and three class periods a week. Prerequisites: *Math. 13; Phys. 16, or 23 and 24;* Phys. 110, 162. Second semester. Mr. Wheeler

Phys. 122. Physical Optics and Spectroscopy (4)

Geometrical optics and the wave theory of light, interference, diffraction, polarization, etc.; exposition of some phases of spectroscopic phenomena. One laboratory and three class periods a week. Prerequisites: *Math. 13; Phys. 23 and 24, or 16.* First semester. Messrs. Cheney, Curtis

Phys. 124. Electrical Discharge through Gases (4)

Properties of gaseous ions; the experimental data leading to the electron theory, including a study of vacuum tube phenomena; ionization and resonance potentials, photo-electricity, etc. One laboratory, and three class periods a week. Prerequisites: *Math. 13; Phys. 16, or 23 and 24;* Phys. 110, 162. First semester. Mr. Wheeler

Phys. 126. Heat and Pyrometry (4)

Pyrometry, calorimetry, heat conduction and thermodynamics; practical exercises in the use of thermocouples, resistance thermometers, pyrometers, and similar instruments. One laboratory and three class periods a week. Prerequisites: *Math. 13, Phys. 16 or 23 and 24.* Second semester.

Mr. Emrich

Phys. 140. Teaching of Physics in Secondary Schools (3)

The aims, methods, and content of a secondary school course in physics. Various physics syllabi are used as an outline. Review of a standard text with simple demonstrations; examination of standard laboratory manuals and performance of selected experiments; discussion of modern physical theories. Open only to teachers or prospective teachers of high school physics. Four conferences and two laboratory periods per week. Summer session. (Not offered in 1949.)

Phys. 160. Introduction to Modern Physical Theories (3)

Recent developments, including Maxwell's field equations, photoelectricity, radiation, the quantum theory, X-rays, relativity, and the structure of the atom. Prerequisites: *Math. 14; Phys. 16, or 23 and 24.* First semester.

Mr. Sawyer

Phys. 161. Introduction to Modern Physical Theories (3)

Continuation of Phys. 160. Prerequisites: *Math. 14; Phys. 16, or 23 and 24;* Phys. 160. Second semester. Mr. Sawyer

Phys. 162. Introductory Theory of Electricity and Magnetism (3)

Magnetic fields and potentials; electrostatic fields, potentials and capacities; the Maxwell-Thomson theory of lines of force; electromagnetic fields; variable and alternating current. Prerequisites: *Math. 106 previously or concurrently, Phys. 16 or 24.* First semester. Mr. Hyatt

Phys. 163. Introductory Theory of Electricity and Magnetism (3)

A continuation of Phys. 162. Mr. Hyatt

Phys. 164. Advanced Physics Laboratory (1 or 2)

Laboratory work of research type. Special problems assigned and the student placed largely on his own initiative. Prerequisite: senior standing in engineering physics. First semester. Messrs. Bayley, Emrich, Myers

Phys. 165. Advanced Physics Laboratory (1 or 2)

Continuation of Phys. 164. Prerequisite: senior standing in engineering physics. Second semester. Messrs. Bayley, Emrich, Myers

Phys. 166. Special Topics in Physics (1-3)

A course covering selected topics in mechanics, heat, sound, and light not sufficiently covered in the general courses. Lectures and recitations or conferences. Prerequisites: Math. 106, Phys. 23 and 24. First and second semesters. Mr. Bartunek

Phys. 167. Special Topics in Physics (1-3)
A continuation of Phys. 166. First and second semesters.
Mr. Bartunek

Phys. 168. Physics Proseminar (1)
Discussion of current problems in physics. Second semester. Mr. Myers

Phys. 170. Spectroscopy (2 or 3)
The interpretation of the findings of modern spectroscopy with particular emphasis on the theory and applications of atomic spectra. The method of obtaining data will be illustrated in laboratory problems. Two class periods per week and one optional laboratory period per week. Students desiring the laboratory work will register for three credits. Second semester.
Mr. Curtis

For Graduates

The election of purely graduate courses in physics should ordinarily be preceded by such study of the particular field as that presented in courses in the "100" group. A thorough knowledge of the differential and integral calculus is presupposed, and further accompanying study of mathematics is generally advisable.

Math. 219 and 220, E.E. 209, 210, 223, and 224, and Mech. 201 may be included in a graduate major in physics.

Phys. 201. Kinetic Theory (3)
The classical considerations of the kinetic theory of gases, substantially as in Boltzmann, with additional applications to electrical phenomena. First semester. Mr. Bartunek

Phys. 202. Thermodynamics (3)
A course devoted principally to classical thermodynamics following Planck. Second semester. Mr. Bartunek

Phys. 207. Theory of Light (3)
The propagation of light; interference, diffraction; the measurement of wave-length; crystal optics; introduction to quantum theories of the interpretation of spectra. First semester. Mr. Cheney

Phys. 208. Theory of Light (3)
Continuation of Phys. 207. Second semester. Mr. Cheney

Phys. 214. Quantum Mechanics (3)
General principles of the present theory; applications to simple problems; perturbation methods; calculation of energy levels and spectral intensities; quantum theory of collision processes and of radiation; nuclear quantum mechanics. First or second semester. Mr. Havas

Phys. 215. Quantum Mechanics (3)
A continuation of Phys. 214. Second semester. Mr. Havas

Phys. 216. Theory of X-rays (3)

The theory of the production and properties of X-rays; reflection, scattering, and dispersion of X-rays; crystal structure determination; X-ray spectra; ejection of electrons. First or second semester. Mr. Bayley

Phys. 220. Theoretical Physics (3)

The fundamental principles of theoretical physics. The subject matter covered in this course and in Phys. 221, 222, and 223 is that generally considered necessary for more detailed work in special fields. Required of all candidates for the doctorate. First semester. Mr. Emrich

Phys. 221. Theoretical Physics (3)

Continuation of Phys. 220. Prerequisite: Phys. 220. Second semester. Mr. Emrich

Phys. 222. Advanced Theoretical Physics (3)

A continuation of Phys. 220 and 221. Required of all candidates for the doctorate. Prerequisite: Phys. 221 or equivalent. First semester. Mr. Bartunek

Phys. 223. Advanced Theoretical Physics (3)

Continuation of Phys. 222. Prerequisite: Phys. 222. Second semester. Mr. Havas

Phys. 226. Nuclear Physics (3)

Studies of stable and unstable nuclei, fundamental nuclear particles, nuclear reactions, and methods of producing them. First semester. Mr. Spatz

Phys. 227. Nuclear Physics (3)

Continuation of Phys. 226, dealing particularly with nuclear theory. Second semester. Mr. Havas

Phys. 231. Methods of Mathematical Physics (3)

The equations of theoretical physics and the methods of their solution. Intended to accompany Phys. 220. First semester. Mr. Wheeler

Phys. 232. Methods of Mathematical Physics (3)

Continuation of Phys. 231. Intended to accompany Phys. 221. Second semester. Mr. Wheeler

Phys. 241. Atomic and Molecular Structure (3)

Studies of the extra-nuclear properties of atoms and molecules as revealed by spectroscopy. First semester. Mr. Curtis

Phys. 260. Seminar in Modern Physics (3)

A discussion of important advances in experimental physics. First or second semester. Mr. Myers

Phys. 261. Seminar in Modern Physics (3)

A discussion of important advances in theoretical physics. First or second semester. Mr. Havas

Phys. 291. Research (3)

Research problems in experimental or theoretical physics. May be repeated for credit. First semester.

Phys. 292. Research (3)

Continuation of Phys. 291. May be repeated for credit. Second semester.

PORTUGUESE

See Romance Languages

PSYCHOLOGY

Professors Ford and W. L. Jenkins
Associate Professor Graham
Assistant Professors N. B. Gross and H. D. Meyer
Dr. Hoffman, Lecturer
Mr. Fatzinger

Psych. 1. Elementary Psychology (3)

The principles of human behavior and the methods of investigation. A foundation course for all students taking further work in psychology. First and second semesters.

Psych. 4. Elementary Social Psychology (3)

Study of representative modern problems, such as leadership, change, conflict, group differences and prejudices, motivating forces, and techniques of control, with a view to acquiring an understanding of social adjustments adequate for responsible citizenship. First and second semesters.

Psych. 16. Psychology in Business (3)

Psychological problems involved in advertising and selling; sales personnel; psychology from the standpoint of the consumer. Prerequisite: Psych. 1. Second semester.

Psych. 22. General Applied Psychology (3)

A survey of present day applications of psychology to problems in personal and vocational guidance, leadership, propaganda and public opinion, industry, business and advertising, law and the criminal code. Prerequisite: Psych. 1. Second semester.

Psych. 51. Readings in Psychology (2 or 3)

Readings on organized topics selected after consultation with staff members. Prerequisite: Psych. 1. First and second semesters.

For Advanced Undergraduates and Graduates

Psych. 102. Psychological Tests and Measurements (3)

The predictive measurements of individual differences, concepts, techniques, and materials necessary to understand selection and guidance problems. Prerequisites: Psych. 1 and a course in elementary statistics.
Mr. Jenkins

Psych. 104. Social Psychology (3)

A psychological interpretation of social phenomena. Prerequisite: Psych. 1. First semester. Mr. Graham

Psych. 108. Genetic Psychology (3)

The genesis, growth, and development of psychological processes, and the bearing of the chief developmental changes upon behavior tendencies. Prerequisite: Psych. 1. Second semester. Mr. Graham

Psych. 109. Abnormal Psychology (3)

Gross maladjustment patterns and deviations in individual and societal behavior. Lectures, discussions, and clinical observations in the psychopathic hospital. Prerequisite: Psych. 1. Second semester. Mr. Graham

Psych. 111. Minor Research (2 or 3)

Assigned problems for investigation. Prerequisites: Psych. 1 and consent of the head of the department. First and second semester.
Messrs. Ford, Graham, Jenkins, Gross, Meyer

Psych. 112. Minor Research (2 or 3)

Either a continuation of Psych. 111 or a different problem for investigation. Prerequisites: Psych. 1 and consent of the head of the department. First and second semesters.
Messrs. Ford, Graham, Jenkins, Gross, Meyer

Psych. 113. Practice in Applied Psychology (3)

Individual problems and programs involving field applications of psychology will be assigned. The objective will be the development of skills and competence in using psychological materials. Prerequisites: six hours of psychology and consent of the head of the department. First and second semesters. Messrs. Ford, Jenkins, Graham

Psych. 114. Practice in Applied Psychology (3)

A continuation of Psych. 113. Prerequisites: six hours of psychology and consent of the head of the department. First and second semesters.
Messrs. Ford, Jenkins, Graham

Psych. 117. Personality (3)

A psychological interpretation of personality, its development, determinants, analysis, and relationship to successful adjustment. Prerequisite: Psych. 1. First semester. Mr. Graham

Psych. 120. History of Psychology (3)

A historical approach to psychological facts, theories, fields, and methods. First semester. Mr. Meyer

Psych. 129. Physiological Psychology (3)

The physiological basis of psychological processes. Two hours of discussion and two hours of laboratory work per week. Prerequisite: Psych. 1. First semester. Mr. Gross

Psych. 131. Neurological Aspects of Behavior (2)

The structures and functions of the nervous system as related to the subject of psychology. One hour of class discussion and two hours of laboratory work per week. Prerequisite: Psych. 1. (Discontinued 1948-1949.)

Psych. 135. Experimental Psychology (3)

Laboratory work and discussions covering sensory processes, simple reactions, and the more elementary aspects of perception. Two hours of discussion and three hours of laboratory work per week. Prerequisite: Psych. 1. First semester. Mr. Gross

Psych. 136. Experimental Psychology (3)

Continuation of Psych. 135. Discussions and laboratory work on selected phases of attention, perception, learning, motivation, emotion, and higher thought processes. Two hours of discussion and three hours of laboratory work per week. Prerequisite: Psych. 135. Second semester. Mr. Gross

Psych. 151. Industrial Training and Work Control (3)

The psychology of learning as applied to job training: incentives, labor relations, fatigue, job analysis, and work grading. Prerequisite: Psych. 1. First semester. Mr. Ford

Psych. 152. Industrial Selection and Classification (3)

Psychological procedures for the selection and classification of employees. Two lectures and two hours of laboratory work per week. Prerequisite: Psych. 1. Second semester. Messrs. Ford, Jenkins

Psych. 154. Psychological Design Factors (3)

The optimal psychological and physiological factors in instrument and machine design. Prerequisite: Psych. 1. Second semester. Mr. Jenkins

For Graduates

Graduate classes will be adjusted to student demand. Seminars and research will be conducted by Messrs. Ford, Graham, Gross, Jenkins, and Meyer in fields of study appropriate to each staff member.

Psych. 203. Seminar in General Psychology (3)

Some significant aspect in psychological theory or principle, but varied from year to year in accordance with students' needs.

Psych. 204. Seminar in General Psychology (3)

Either a continuation of Psych. 203 or a new topic.

Psych. 205. Seminar in Applied Psychology (3)

Some significant applications in psychology. The topic will vary from year to year in accordance with students' needs.

Psych. 206. Seminar in Applied Psychology (3)

Either a continuation of Psych. 205 or a new topic.

Psych. 209. Systematic Psychology (3)

A critical approach to the methods, evidence, and theories of psychology; the building of an organization of basic principles. Mr. Jenkins

Psych. 210. Systematic Psychology (3)

A continuation of Psych. 209. Prerequisite: Psych. 209. Mr. Jenkins

Psych. 211. Major Research (3)

Assigned problems for investigation on a graduate level.

Psych. 212. Major Research (3)

Either a continuation of Psych. 211 or a new problem.

PUBLIC SPEAKING

See English, Speech

RELIGION

Assistant Professors A. M. Sherman and Bean

Relig. 11. Jesus and New Testament Religion (3)

Study of the Gospels of Matthew, Mark, Luke, and John, with emphasis on content; origin and nature of the New Testament. First semester.

Relig. 12. Paul and the Early Church (3)

Study of the New Testament Epistles, especially those of St. Paul, the Book of Acts, and the Book of Revelation, with emphasis on content; consideration of the situation which produced these writings. Second semester.

Relig. 13. Great Living Religions (3)

Study of Mohammedanism, Buddhism, Hinduism, Confucianism, Taoism, Marxism, and nationalism, followed by a consideration of Judaism and Christianity; the great ideas, institutions, and history of each religion, and their interrelationship; readings from the classic scriptures of the great religions. First semester.

Relig. 14. An Introduction to Judaism and Christianity (3)

More detailed consideration of the two major Western religions than in Relig. 13. Historical survey of Judaism and Christianity; relationship of the major branches of the two religions; comparison of the more important doctrines and practices. Second semester.

Relig. 15. The Old Testament and Hebrew Religion (3)

Methods of approach in the study of the Bible, with particular reference to the Old Testament; history of the ancient Hebrews, with emphasis on their unique religious development; the great teachings of the Hebrew prophets and applications of same to present day problems. First semester.

Relig. 16. Problems of Religious Thought (3)

Consideration of such major problems as the nature and function of religion, the meaning of God, the religious interpretation of human nature, reason and revelation, the meaning of history, religious utopias, and world society; discussion of classic, medieval, and modern answers to these problems; readings in the works of the great theologians of the past and present. Second semester.

ROMANCE LANGUAGES

Professor Barthold
Associate Professor Soto, Assistant Professor Farné
Messrs. Flores, DeCastro, and Niles

FRENCH

Fr. 1. Elementary French (3)

Basic French grammar illustrated by oral and written exercises. Attention paid to correct pronunciation of simple spoken French. No previous study of French required. First semester.

Fr. 2. Elementary French (3)

Continuation of Fr. 1, with the addition of the use of simple vocabulary-building texts. Prerequisite: Fr. 1. Second semester.

Fr. 11. Intermediate French (3)

Reading based on works of the nineteenth and twentieth century writers; formal review of French grammar; prose composition; outside reading. Prerequisite: *one year of college French or two units of entrance French.* First semester.

Fr. 12. Intermediate French (3)

Continuation of Fr. 11. Prerequisite: Fr. 11. Second semester.

Fr. 13. Types of French Literature (3)

Training in the ability to read and understand representative works from the seventeenth century to the present day. Prerequisites: Fr. 11 and 12, or three units of entrance French. First semester.

Fr. 14. Types of French Literature (3)

Continuation of Fr. 13. Prerequisite: Fr. 13. Second semester.

Fr. 21. Seventeenth Century French Literature (3)

The age of classicism. Lectures, study of texts, collateral readings, and reports. Prerequisites: Fr. 13 and 14. First semester.

Fr. 22. Eighteenth Century French Literature (3)

The rise of liberalism as reflected in the writings of Montesquieu, Diderot, Rousseau, and Voltaire. Prerequisites: Fr. 13 and 14. Second semester.

Fr. 31. Nineteenth Century French Literature (3)

Main literary currents of the nineteenth century; romanticism and realism. Lectures, reports, collateral readings. Prerequisites: Fr. 13 and 14. First semester.

Fr. 32. Nineteenth Century French Literature (3)

Continuation of Fr. 31. Prerequisite: Fr. 31.

Fr. 41. French Oral and Written Composition (3)

For students who wish a greater opportunity for practice in the oral and written use of French than can be provided in the literature courses. Prerequisites: Fr. 13 and 14. First semester.

Fr. 42. French Oral and Written Composition (3)

Continuation of Fr. 41. Prerequisite: Fr. 41. Second semester.

For Advanced Undergraduates and Graduates

Fr. 101. French Literature before the Seventeenth Century (3)

Survey of French literature from its beginning through the sixteenth century. Prerequisites: Fr. 31 and 32, or the equivalent. First semester. (Not offered 1949-1950.) Mr. Barthold

Fr. 102. Contemporary French Literature (3)

Prerequisites: Fr. 31 and 32, or the equivalent. Second semester. (Not offered 1949-1950.) Mr. Farné

Fr. 103. Proseminar (3)

Study of the works of some author or group of authors or of a period. Prerequisites: Fr. 31 and 32, or the equivalent. First semester. Mr. Barthold

Fr. 104. Proseminar (3)

Continuation of Fr. 103. Second semester. Mr. Farné

For Graduates

To be accepted as candidates for the master's degree with a major in French, students must have completed not less than twelve semester hours of French language and literature beyond the standard intermediate courses and must possess a general knowledge of English literature. A reading knowledge of Latin and German is desirable. A thorough acquaintance with Latin grammatical forms is esential for Fr. 201 and 202.

Fr. 201. Old French (3)
First semester. (Not offered 1949-1950.)

Fr. 202. Old French (3)
Continuation of Fr. 201. Second semester. (Not offered 1949-1950.)

Fr. 203. French Literature of the Renaissance (3)
First semester. (Not offered 1949-1950.)

Fr. 204. French Literature of the Renaissance (3)
Continuation of Fr. 203. Second semester. (Not offered 1949-1950.)

Fr. 211. The History of the Novel in France (3)
Reading of representative works of different periods and analysis of the growth of the novel as a literary form. First semester.

Fr. 212. The History of the Novel in France (3)
Continuation of Fr. 211. Second semester.

Fr. 213. Modern French Poetry (3)
A history of French poetry from the Parnassian school to the present day. First semester.

Fr. 214. Contemporary French Theater (3)
A history of the contemporary French theater from the *Theatre libre* to the present day. Second semester.

ITALIAN

Ital. 1. Elementary Italian (3)
Grammar; composition; rapid reading of easy modern prose. No previous study of Italian required. First semester.

Ital. 2. Elementary Italian (3)
Continuation of Ital. 1. Prerequisite: Ital. 1. Second semester.

Ital. 11. Intermediate Italian (3)
The age of Dante. Lectures in English on Dante and his contemporaries; readings in the *Divina Commedia.* Prerequisites: Ital. 1 and 2. First semester. (Not offered 1949-1950.)

Ital. 12. Intermediate Italian (3)
Continuation of Ital. 11. Second semester. (Not offered 1949-1950.)

PORTUGESE

Port. 1. Elementary Portuguese (3)

A study of Portuguese grammar and forms; practice in writing and speaking Portuguese. Prerequisite: consent of the instructor. First semester. (Not offered 1949-1950.)

Port. 2. Elementary Portuguese (3)

Continuation of Port. 1. Second semester. (Not offered 1949-1950.)

SPANISH

Span. 1. Elementary Spanish (3)

Basic Spanish grammar illustrated by oral and written exercises. Attention paid to correct pronunciation of simple spoken Spanish. No previous study of Spanish required. First and second semesters.

Span. 2. Elementary Spanish (3)

Continuation of Span. 1, with the addition of the use of simple vocabulary-building and reading texts. First and second semesters.

Span. 11. Intermediate Spanish (3)

Reading of modern Spanish prose, with a view to acquiring exactness and speed in reading; rapid review of grammar with prose composition. Prerequisite: *one year of college Spanish or two units of entrance Spanish.* First semester.

Span. 12. Intermediate Spanish (3)

Continuation of Span. 11. Prerequisite: Span. 11. Second semester.

Span. 21. Introduction to Modern Spanish Fiction (3)

Reading and discussion of selected novels and short stories; outside reading and reports. Prerequisites: Span. 11 and 12, or three units of entrance Spanish. First semester.

Span. 22. Introduction to Modern Spanish Drama (3)

Reading and discussion of selected plays; outside reading and reports. Prerequisite: Span. 21. Second semester.

Span. 31. Spanish Oral and Written Composition (3)

For students who wish a greater opportunity for practice in the oral and written use of Spanish than can be provided in the literature courses. Prerequisite: *consent of the head of the department.* First semester.

Span. 32. Spanish Oral and Written Composition (3)

Continuation of Span. 31. Second semester.

For Advanced Undergraduates and Graduates

Span. 101. Spanish Fiction of the Golden Age (3)

The Spanish novel of the sixteenth and seventeenth centuries, with special attention to Cervantes' *Don Quijote.* Lectures, collateral reading, and reports. Prerequisites: Span. 21 and 22. First semester. Mr. Soto

Span. 102. Spanish Drama of the Golden Age (3)

Selected plays by Lope de Vega, Tirso de Molina, Ruiz de Alarcón, and Calderón. Lectures, collateral reading, and reports. Prerequisites: Span. 21 and 22. Second semester. Mr. Soto

Span. 103. Proseminar (3)

A study of the works of some author or group of authors or of a period. Prerequisites: Span. 21 and 22. First semester.

Span. 104. Proseminar

Continuation of Span. 103. Second semester.

Span. 111. Spanish-American Literature (3)

Brief survey of the whole field of Spanish-American literature, with emphasis on works of modern writers. Prerequisites: Span. 21 and 22. First semester. Mr. Soto

Span. 112. Spanish-American Literature (3)

Continuation of Span. 103. Second semester. Mr. Soto

For Graduates

To be accepted as candidates for the master's degree with a major in Spanish students must have completed not less than twelve semester hours of Spanish language and literature above the standard intermediate courses. A reading knowledge of Latin and French is desirable.

Span. 201. Old Spanish (3)

First semester. (Not offered 1949-1950.)

Span. 202. Old Spanish (3)

Continuation of Span. 201. Second semester. (Not offered 1949-1950.)

Span. 211. The Modern Spanish Novel (3)

Reading, reports, and lectures. First semester.

Span. 212. The Modern Spanish Novel (3)

Continuation of Span. 211. Second semester.

SOCIOLOGY

See Economics and Sociology

DIVISION OF ATHLETICS AND PHYSICAL EDUCATION

P. L. Sadler, *Director*

P. E. Short, *Assistant Director and Business Manager*

E. F. Caraway, *Assistant Director and Program Manager*

F. C. Bartlett, *Assistant Director of Physical Education*

The Division consists of the Department of Intercollegiate Athletics and the Department of Physical Education and Intramural Sports. It has supervision over the entire field of intercollegiate athletics and physical education. Its activities consist of intercollegiate athletics, intramural athletics, required physical education, including corrective exercises, and special courses of instruction in preparation for coaching and teaching physical education.

Experience indicates that it is essential that the physical education program emphasize the physical fitness and efficiency benefits to be derived from a well-rounded and athletic phase of the program. The purpose of the athletic, physical education, and intramural sports program is designed to:

a. Raise and maintain the physical standards of the University.

b. Develop and maintain a high level of all-around physical fitness so that the undergraduate student may more readily assimilate instruction.

c. Encourage regular and healthful exercise by the development of skills, techniques, and attitudes.

d. Foster an aggressive and cooperative team spirit, to increase the confidence of the individual, to develop sportsmanship, and to increase university pride through participation in vigorous competitive athletics.

Facilities for accomplishing this aim and purpose are afforded in Taylor Gymnasium, Grace Hall, the field house, the two playing levels of Taylor Field, and Lehigh Field.

DEPARTMENT OF INTERCOLLEGIATE ATHLETICS

Director Sadler
Assistant Directors Short and Caraway
Messrs. Sheridan, Leckonby, Yarbro, White, Packer,
Christian, Dockham, Reno, and Mann

The Department of Intercollegiate Athletics offers opportunity to the undergraduate student body to participate in intercollegiate competition both at home and away with institutions which are Lehigh's natural rivals and also other institutions which are at some distance.

The intercollegiate program consists of varsity teams in football, soccer, wrestling, basketball, swimming, tennis, track, baseball, golf, lacrosse, hockey, and fencing, junior varsity teams in football, wrestling, basketball, swimming, and baseball, as well as freshman teams in most of the above sports.

DEPARTMENT OF PHYSICAL EDUCATION AND INTRAMURAL SPORTS

Professor Sadler
Assistant Professors Bartlett and Yarbro
Messrs. Christian and Dockham

The Department of Physical Education and Intramural Sports has supervision and control of the required recreational physical activities of the student body. The aim of the department is to insure the health and physical development of every student of the University.

Through its program in physical education and intramural sports the University endeavors to maintain among its students a high degree of physical fitness, to establish habits of regular and healthful exercise, to foster the development of such valuable by-products as self-confidence, good sportsmanship, and a spirit of cooperation, and to provide each student with ample opportunity for acquiring an adequate degree of skill in sports of the type in which participation can be continued after graduation.

All students are required to engage in some form of activity under departmental supervision. This requirement calls for three hours a week in the gymnasium or participation in an organized sport. Members of the R.O.T.C. unit substitute one hour of military drill for one of the three hours of physical education.

Each student is given an annual physical examination by the director of the Students' Health Service, assisted by the department of physical education. He is advised as to postural and physical defects.

All freshmen are required to take a physical efficiency test for the purpose of classification and development. All students are required to participate in some form of activity under departmental supervision. This requirement calls for three hours a week in the gymnasium or participation, under the supervision of the department, in an organized sport. In the gymnasium, opportunity is offered in the following activities: mass exercises, mass swimming, beginners' swimming, boxing, fencing, apparatus exercises, handball, life-saving, badminton and sports fundamentals. All undergraduate students must swim 75 feet before graduation. Students are encouraged to change their activities whenever it is thought best for their all-round development.

A comprehensive program in intramural sports is sponsored for the student body including fraternity, dormitory, interclass, town, and independent groups in touch football, tennis, soccer, badminton, handball, golf, individual athletics, basketball, swimming, wrestling, track, softball, volleyball, and recreative games. Students are encouraged to participate in these sports, and awards are given for excellence in performance.

Individual exercises are prescribed for the correction of physical and functional defects. Students of this group are carefully examined and individually guided.

The University maintains a well-equipped dispensary for medical treatment. If a student is injured while engaged in any sport he must report as soon as possible to the director of the Students' Health Service.

The following physical education courses are required of all physically qualified students:

P.E. 1. Physical Education
Freshman first semester.

P.E. 2. Physical Education
Freshman second semester.

P.E. 3. Physical Education
Sophomore first semester.

P.E. 4. Physical Education
Sophomore second semester.

P.E. 5. Physical Education
Junior first semester.

P.E. 6. Physical Education
Junior second semester.

P.E. 7. Physical Education
Senior first semester.

P.E. 8. Physical Education
Senior second semester.

For Sophomores, Juniors, and Seniors

In addition to courses designed to provide healthful and recreative exercise for all students, the department of physical education offers work preparatory to the teaching of physical education and the coaching of athletics, which may be elected by qualified members of the sophomore, junior, and senior classes. They are primarily for those students who are preparing for professional careers in teaching and athletic coaching. They are also open to other students who are interested in a study of coaching and physical education.

P.E. 22. Football Coaching, Conditioning, and Equipping (3)

Classroom and field instruction in the play of each individual position; intensive study of the football rules and of various systems of attack and defense. Prerequisite: sophomore standing. Second semester.

P.E. 23. The Organization and Administration of Physical Education (2)

THEORY. Organization and supervision of physical education programs; history of physical education systems; administration of intramural activities; qualifications of physical educators; methods of teaching; planning of programs. Prerequisites: Educ. 1, sophomore standing. First and second semesters.

P.E. 24. The Organization and Administration of Physical Education (1)

PRACTICE. The practice of teaching mass physical activities including athletics, combative events, gymnasium games, apparatus, stunts, and efficiency tests. Programs of corrective exercises for postural defects are considered. Three hours practice a week. Prerequisites: sophomore standing. First and second semesters.

P.E. 30. Baseball and Basketball Coaching, Conditioning, and Equipping (3)

Technique of individual positions in baseball, together with systems of attack and defense; fundamentals of basketball, including stops, turns, passes, zone defense, man-to-man defense, and different styles of attack. Prerequisites: sophomore standing. First semester.

P.E. 31. Track, Wrestling, and Swimming Coaching, Conditioning, and Equipping (3)

Theory and application of fundamentals, including form in the various track events, holds and defenses in wrestling, and the various strokes and dives in swimming; proper training and conditioning for each of these sports. Prerequisites: sophomore standing. Second semester.

P.E. 32. The Administration of High School and Preparatory School Athletics (3)

Arrangement of schedules, budget-making, and care of equipment; responsibility for prevention of athletic injuries and for care of the injured; methods of protecting against injury; immediate care and final treatment of injuries; return to athletics after injury. Prerequisites: Educ. 1, sophomore standing. First and second semesters.

General Information

SUMMER SESSIONS

The courses offered during the 1948 Summer Session were arranged in three groups: (1) the regular session of six weeks, June 29 through August 11, designed primarily for graduate students, teachers, and adults interested in special college work; (2) the post-session, August 12 through August 28, designed primarily for graduate students; (3) the workshop, June 29 through August 2, consisting of a program in the field of curriculum development exclusively for teachers. All Summer Session courses are open to both men and women.

The *Summer Session Announcement,* containing a full description of courses to be offered in 1949 together with information concerning admissions, fees, etc., will be sent on request addressed to the director of the Summer Session. The following courses were offered in the Summer of 1948.

SUMMER SESSION COURSES

REGULAR SUMMER SESSION

June 29 through August 11, 1948

Educ.	140.	Principles of Elementary Education	(3)
Educ.	150.	Principles of Secondary Education	(3)
Educ.	173.	Diagnostic and Remedial Teaching	(3)
Educ.	190.	Visual Instruction	(3)
Educ.	219.	Social Policy and Education	(3)
Educ.	222.	Education of Exceptional Children	(3)
Educ.	243.	Elementary School Administration	(3)
Educ.	253.	Secondary School Administration	(3)
Educ.	258.	Extra-Curricular Activities	(3)
Educ.	263.	Public School Administration	(3)
Educ.	266.	Supervision of Instruction	(3)
Educ.	272.	Educational Tests and Measurements	(3)
Educ.	282.	Educational and Vocational Guidance	(3)
Educ.	293.	Individual Research	(3)
Educ.	296.	Seminar in Public School Administration: Public School Relations	(3)
Engl.	220.	Graduate Seminar: Shakespeare	(3)
Engl.	231.	Graduate Thesis	(3)
Engl.	232.	Graduate Thesis	(3)
Speech	161.	Dramatics	(3)
Journ.	101.	Modern Newspaper Practice	(3)
Hist.	151.	A Pro-Seminar in United States and Pennsylvania History for Teachers	(3)
Hist.	215.	American Constitutional History	(3)

POST-SESSION

August 12 through August 28, 1948

Educ. 121.	The Diagnosis and Adjustment of Reading Difficulties	(3)
Educ. 254.	Secondary School Curriculum	(3)
Educ. 295.	Seminar in Public School Administration: Personnel	(3)

WORKSHOP

June 29 through August 2, 1948

Educ. 191.	Workshop: Curriculum Development	(3, 5, 6)

GENERAL COLLEGE DIVISION

The General College Division, plans for which were approved by the faculty on April 6, 1942, was organized to supplement the work of the established undergraduate curricula by meeting the educational needs of certain special groups of students. The Division aims to provide an opportunity for young men not planning a four year program to pursue such work, either of a general or a more specialized nature, as their preparation and interests make desirable; a trial period for those who wish to become candidates for baccalaureate degrees but whose preparatory training does not fully satisfy the entrance requirements for the curricula of their choice; and facilities for qualified male adults to continue their education without being committed to a restricted or specialized program.

Although all work available through the General College Division will be found at present among the regular offerings of the several departments, the work taken by students enrolled in this division is not regarded as primarily preparation for admission to the upper classes of the University; rather, the courses are looked upon as complete in themselves. As time indicates certain needs not recognized at the moment, consideration will be given to the development of special courses for the General College Division group.

Each student in the General College Division has an individual program, one not subject to distribution or curriculum requirements, yet one limited by the student's ability to meet the prerequisites of the courses which he desires to take. With but few exceptions, the student enrolled in this division enjoys the same privileges as all other undergraduates in the University, including eligibility to unrestricted prizes, access to student aid, and the right of petition; and he is also subject to the same general regulations, those pertaining to scholastic probation not excepted. The General College Division student will not, however, be a candidate for a degree, save in those instances where transfer to one of the undergraduate programs of study leading to degrees is approved by a committee composed of directors of curricula.

ADULT EDUCATION PROGRAM

The Adult Education Program is committed to serving the needs and interests of people in all walks of life. It is limited to courses offered in the afternoon, evening, and Saturday sessions, but is open alike to men and women students of twenty-one years of age and older.

A wide variety of courses is included in the present program. Some are intended to meet specific needs of special groups, such as school teachers and administrators. Others attempt to serve the general public in such fields as art, literature, history, government, and international relations. Still others result from cooperative arrangements with business and industry, and with service and welfare agencies.

The Adult Education Program, approved by the faculty on March 6, 1944, is a recognition of the principle that social institutions have service responsibilities within their spheres of influence. As a private educational institution, Lehigh University's interest is as great but its area of operation properly more restricted than that of a publicly supported institution of higher learning. It is the desire of the University to meet the increasing demand for this new service through a flexible program closely adjusted to individual needs and interests.

PROGRAM IN GENERAL EDUCATION

A program in general education, inaugurated in 1936, provides an opportunity for those students who desire to read either for the purpose of broadening their range of intellectual interests or to pursue some special line of reading not available in regular classroom instruction. Students participating in this program are afforded an opportunity to discuss not only their reading but also their intellectual problems in general with a faculty adviser with whom they come to feel a personal relationship. The independent pursuit of knowledge and the intellectual self-development of the student comprise the aim of the program.

The advisory council for general education, consisting of a group of faculty members with special aptitude for this work, is in charge of the program in general education. Each year the council formally invites the members of the freshman class to apply for enrollment in the program, but any student in the University may at any time apply to the chairman of the council for admission. No credit toward a degree is allowed for this work, and there are no regular hours or assignments. The conduct of the work is left entirely to the student and his faculty adviser. Only those students, however, who appear able to profit by the program are admitted.

There is no fee in connection with the work of the program in general education.

RELIGIOUS OBSERVANCES

On each Sunday of the academic year chapel services are held at 11:00 A.M. in Packer Memorial Church, with the chaplain of the University in charge. Outstanding leaders of the Christian Church fill the pulpit approximately once a month. Holy Communion services are held every Sunday at 10:00 A.M.

There are also a number of special religious observances, such as the All-University Chapel Service and Convocation, which marks the official opening of each semester; the annual Christmas Vesper Choral Program; the presentation by the Chapel Choir of Sir John Stainer's cantata "The Crucifixion" during Holy Week; and the annual Memorial Service in May.

Attendance at all religious services is voluntary.

STUDENTS' HEALTH SERVICE

The Students' Health Service has general charge of all health and sanitary measures in the University. The work of the department at this time is organized under three heads: sanitation, physical examinations, and dispensary service.

SANITATION. The director of the health service is in direct charge of the sanitation of University buildings and grounds, and exercises such supervision as is possible over other accomodations for students.

PHYSICAL EXAMINATIONS. A physical examination is required of all students. This examination serves the needs of the health service and the department of physical education, and complies with the requirements of the Reserve Officers' Training Corps. A tuberculosis survey is made also of all entering students, with the exception of those who have had negative chest X-rays within six months. All physical defects and departures from normal are noted; and the students are divided into groups as follows: (1) those who present no abnormalities, (2) those who are subnormal rather than abnormal and who should be brought up to normal by the regular courses in physical education, and (3) those who require special or corrective treatment.

Students who fall into the second and third groups are observed at regular intervals, and every effort is made to bring them up to the highest degree of physical development and health. Individual records are kept on the progress of each case.

DISPENSARY SERVICE. Students may receive treatment for minor illnesses and injuries at the Dispensary from 8:30 A.M. to 12:00 M. on all week days, from 1:30 to 5:00 P.M. on week days except Saturday, and by appointment on Sunday. A physician and a nurse are on duty in the Dispensary during these hours. While the health service does not furnish medical attendance to students who are sick in their rooms, members of the staff keep in touch with such cases by telephone and otherwise in so far as is possible, in order to see that the students are receiving proper attention and that the time lost from University work is minimized. It is requested that all such cases, together with the names of the attending physician, be reported to the director in order that a complete record of the health of each student may be kept.

Personal records concerning background and pre-college history of students are kept on confidential file to aid in evaluating cases of students who have difficulty in adjusting themselves to college routines. Special attention in personal adjustment problems is given to students who request it.

UNIVERSITY COUNSELING CENTER

The general purpose of the University Counseling Center is to assist individual students who may desire personal, educational, or vocational counseling.

Many normal individuals fail to achieve genuine satisfaction and true success because they are blocked by lack of knowledge of their ability and aptitudes, inadequate vocational information, or inability to make personal and social adjustments.

The primary aim of counseling is to aid the student in gaining a better understanding of himself, so that he may have a basis for more satisfactory adjustments.

There is available at the Center, a well-developed library of occupational and educational materials, and a variety of interest, achievement, personality, aptitude, and ability tests for the use of the student in self-appraisal. Every student in the University is privileged to avail himself of this counseling service.

For those students who are handicapped by inadequate reading or study habits, the center offers an opportunity to participate in a comprehensive program of analysis and improvement. A reading diagnosis, if desired, is designed to assist the student in evaluating his particular needs. Courses for the improvement of reading habits and for more effective study are organized on a voluntary basis to assist those who are interested.

UNIVERSITY LIBRARY

The general library of the University has at present approximately 275,000 volumes. Periodicals subscribed to by the library and by departments which make current issues available to all interested members of the University family number approximately 1200. Most of the bound volumes and all unbound numbers of periodicals except the latest issue of each may be borrowed for use outside the library. Students are admitted freely to the stacks without special permission; and access to volumes, including rare books, which are not on the open shelves can always be had by asking permission of the officer in charge.

Included among the volumes in the library are the latest editions of all standard reference works of a general nature, those more specialized reference works which are of particular interest to undergraduate and graduate students in the several curricula, and all indexes to periodical literature required for research in the various fields in which students may concentrate. The library is particularly rich, for one of its size, in its collection of American newspapers, in the history of early science, in materials for research in history, and in the files of technical journals. It is also a partial depository for government documents. The *Library of Congress Catalogue of Printed Cards* is available for consultation in the cataloguing department.

Special collections of books owned by Lehigh are described in the following paragraphs.

The Rare Books Collection

The rare books collection, which is housed in the Treasure Room of the Library, contains nearly 6,000 volumes. The collection is rich in the fields of literature, classic and modern, and of science, pure and applied. Among the works are the first, second, third, and fourth folios of Shakespeare, a superlative collection of Restoration Drama first editions, a good working collection of Shelleyana, manuscripts in the hands of Faraday and Newton, the first Latin edition of Euclid's geometrical propositions, Agricola's *De Re Metallica,* a first edition of John James Audubon's *Birds of America,* a copy of the Bach Gesellschaft edition of the works of Johann Sebastian Bach, and numerous items in Americana.

The Lehigh Collection

Official publications of the University and works of Lehigh staff members, students, and alumni are kept in a special collection, known as the Lehigh Collection, to insure permanent preservation. Theses submitted by students in partial fulfillment of requirements for degrees are included in this collection.

The Eckley B. Coxe Memorial Collection

In memory of Eckley B. Coxe, for many years a trustee of the University, Mrs. Coxe presented to the University his technical library consisting of 7,727 volumes and 3,429 pamphlets. As the working library of a man who was remarkable for the extent and thoroughness of his acquaintance with the whole field of applied science, this collection possesses great value for students of science and engineering.

The Joseph W. Richards Collection

The Joseph W. Richards Library of Metallurgy and Chemistry, consisting of about 3,000 volumes, is located on the second floor of Williams Hall and is open for use under the supervision of the department of metallurgy.

ART GALLERY

In the Lehigh Art Gallery, located on the third floor of the University Library, there are held frequent exhibitions of paintings, watercolors, drawings, sculpture, photographs, or prints, chiefly by contemporary American and foreign artists. The University owns a small collection of prints and a few paintings, largely gifts of alumni and friends, which are also exhibited from time to time. The offerings of the Art Gallery constitute a definite part of the University's educational and cultural program. While intended primarily for the interest of students, the exhibitions are open to the public.

PLACEMENT BUREAU

The University maintains a placement bureau for the performance of three major functions: student part-time aid, senior placement, and alumni placement.

Although the bureau does not guarantee employment, it is ready to aid students and alumni in every possible way to secure desired work.

Student Part Time Aid. Students who are in need of financial assistance are aided in securing employment on the campus and in the community. Through the work of the placement bureau, in cooperation with the faculty and local merchants, many students who otherwise would find it impossible to do so are able to continue their courses in college.

Seldom can a student, even though he possess unusual mental capacity and physical vigor in addition to extraordinary industry, hope to earn all of his expenses. Even with provision for his tuition, such a student will find it difficult to earn enough to care for his other expenses. An extensive money-earning program is a mistake unless it is absolutely necessary, but a modest program is possible for those students who have determination and the willingness to endure the hardships which accompany such a program.

Senior Placement. Throughout the college year the placement bureau and the directors of curricula receive on the campus the personnel representatives of many industries and business houses. These representatives are provided with facilities for interviewing seniors, with the result that a large portion of the students interviewed secure positions which they assume upon graduation.

In addition to these interviews at the University, many are arranged for seniors at the offices of companies which do not send personnel representatives to the campus.

An important activity, intimately associated with senior placement, is the placing of undergraduates in positions during their summer vacations, in order that they may gain preliminary experience in their chosen fields prior to graduation.

The work of the placement bureau does not cease at commencement time, but continues all year. The combined efforts of the placement bureau, the directors of curricula, and the seniors themselves, result yearly in the placement of practically all graduating seniors who seek employment.

Alumni Placement. The placement bureau acts as a clearing house for the placement of alumni who are seeking employment or better positions. During the course of the year, many alumni find employment through this service.

FINANCIAL AID

UNDERGRADUATE SCHOLARSHIPS AND LOANS

GENERAL STATEMENT

For students needing financial aid to attend Lehigh University, two types of assistance are available: tuition scholarships and tuition loans.

Eligibility.

New Students: *Freshmen*

New students are eligible to apply for the following scholarships, but only if they are not transferring from another college:

1. Competitive Regional Scholarships (page 277).
2. Trustee Scholarships (page 279).

3. Endowed Scholarships, within the conditions of each scholarship's restrictions as stipulated in the description below (page 280, page 281).

A freshman who barely meets the minimum scholastic standard specified below is qualified to enter competition for financial aid; but funds available are awarded on a competitive basis. Only a candidate who ranks well up in the top fifth of his graduating class, who does well in his College Entrance Examination Board tests, or who has achieved some distinction in non-academic activity, should expect success in the competition.

New Students: Transfers

A student transferring from another four-year college, unless he has been graduated, is not eligible to apply for a tuition scholarship until he has completed one year of residence at Lehigh University.

A student entering from a recognized junior college with full transferred credits (junior standing) may be a candidate for a tuition scholarship on his junior college record.

Students Currently Enrolled

Students who are already enrolled at Lehigh and have been in residence for one college year or more are eligible to apply for any of the tuition scholarship or loan awards, with the exception of the Competitive Regional Scholarships, competition for which is open only to prospective freshmen at the time of their application for admission.

Veterans

Students entering or returning to Lehigh under the benefits of government subsidies for education as provided by Public Law 16 or Public Law 346 normally are not eligible for tuition scholarship awards. The only exceptions are former Lehigh students who held tuition scholarships before they left for service and whose educational benefits under the provisions of Public Law 346 are inadequate to cover their entire educational program. Such students should consult the dean of students for further information regarding these special provisions.

Special financial aid in the form of loans or grants is also available to enrolled veterans whose government benefits are inadequate to meet their necessary expenses or who need temporary financial assistance pending receipt of their subsistence checks from the government.

APPLICATION. Candidates for scholarships or loans must make application on forms provided by the committee on scholarships and loans. Candidates not previously enrolled in the University should write for the form to the director of admissions; candidates who have been enrolled in the University one semester or longer should write to the dean of students. Dates for filing applications are:

1. Before March 1, for entering freshmen and transfer students from other colleges.

2. Before May 15, for sophomores, juniors, or seniors who have been in residence for one or more academic years. It is to a candidate's advantage to send in his application by May 1.

Any application for scholarship aid not conforming to the above procedures can be given consideration only if funds are still available when a late application is received.

All requests must be based on a budget for at least a full academic year (two semesters).

ACCEPTANCE. All new students to whom scholarships or loans are awarded, must signify their acceptance of the award within ten days, at the same time sending in the formal acceptance of admission with the $50.00 admission deposit, unless this has already been attended to. Awards are automatically withdrawn after ten days if these terms have not been fully met.

TUITION SCHOLARSHIPS

Competitive Regional Scholarships

Lehigh University offers each year ten scholarships valued at $2,800.00 each for four years of college work which are reserved for entering freshmen and awarded on a competitive basis. These scholarships provide an award of $350.00 each semester for eight semesters, in any of the undergraduate curricula of the University.

The scholarships once assigned continue in force for the full four years of the student's residence at Lehigh University, unless the holder fails to meet the scholastic requirement of a 2.50 average or better and the qualifications of a good citizen. The award is based strictly on merit, irrespective of the need for financial aid.

In order to compete for one of these scholarships, a freshman candidate must take the following steps:

1. Write a letter to the director of admissions of Lehigh University indicating his intention to compete and requesting a form on which to submit his application.

The application should be received by the director of admissions before March 1 of the calendar year in which the applicant expects to enter the University.

2. Submit a record of his secondary school preparation, which must meet all entrance requirements for the particular college he wishes to enter. A preliminary record must be submitted, on forms which will be provided, as soon as possible after the close of the first semester of the senior or final year of secondary school preparation.

3. Submit on the form provided a complete record of his secondary school extra-curricular activities, to which should be added information regarding any important piece of creative work, independent study, or other notable accomplishments which do not appear in his regular record submitted for admission. His guidance officer must attest the accuracy of this record.

4. Ask his principal or headmaster to send to the director of admissions of Lehigh University a general character recommendation and a general estimate of his fitness to do college work.

5. Compete in certain examinations offered under the auspices of the College Entrance Examination Board, as assigned by the director of admissions.

Awards will be made in the order of the contestants' ratings on such weighed factors as secondary school scholastic record, evidences of effective leadership and distinguished group service, character and personality, and performance in the competitive examinations, the last factor being the most heavily weighted.

Awards will be assigned geographically, two each to the New England States and the Middle Atlantic States, three to the Southeastern States, and three at large. However, if in any year the candidates in any area do not show total weighted ratings reasonably commensurate with the ratings of runners-up in other geographical divisions, one or more of the awards to that area may lapse for that year and be assigned to superior candidates from other geographical divisions.

Further details regarding the taking of the examinations and the records to be submitted will be forwarded to applicants upon request.

Address all communications to: The Director of Admissions, Lehigh University, Bethlehem, Pennsylvania.

Trustee Scholarships

By action of the board of trustees, a number of free scholarships are awarded annually to undergraduate students. The usual award amounts to one-half the tuition payment, giving full and final remission of one-half of each semester's tuition charge. In exceptional cases an award may be made in the amount of the full tuition charge. (See also "Tuition Loans" below.)

The bases of award for trustee scholarships are: (1) financial need, (2) character and personality, (3) leadership qualities and participation in school or college activities other than scholastic, and (4) high scholastic achievement. "High scholastic achievement" for a freshman is evidenced by rank in his secondary school graduating class and by performance in the scholarship examinations of the College Entrance Examination Board; for the student already enrolled, by his semester grade averages.

The committee on scholarships and loans must be thoroughly convinced that the student is unable to pay his tuition in full or part and that, with the tuition aid granted, the student will be fully able to finance himself for the year with no serious difficulty. The burden of positive proof on these points is placed on the student. An inquiry form regarding financial status is a part of the application-for-aid form.

Evidence must be presented of excellence of character and personality.

Other factors being equal, preferential consideration may be given to the student who, in addition to making a meritorious scholastic record, has also been able to demonstrate successful leadership in one or more non-scholastic activities in school or on campus.

Each scholarship is awarded for one college year only. However, a student receiving such an award may apply on his record for a further award for the following year, with the expectation that it will be continued unless his scholastic average falls below 2.00 for the preceding college year (two semesters).

The minimum scholastic requirement is, in the case of a freshman, rank in the top third of his graduating class in high school or preparatory school, and in the case of a sophomore, junior, or senior, an average grade during the previous academic year of 2.00 or better. (Average grades are computed by weighting A as 4, B as 3, C as 2, D as 1, and F as 0.) College Board scores are comparative; the minimum score required of candidates varies with the competition.

Endowed Scholarships

Income from endowments made by alumni and friends of Lehigh University provide limited funds for tuition scholarships.

The bases for these awards are the same as for the awards of trustee scholarships (page 279), subject to the restrictions in the deeds of gift, which often make these funds available only to students meeting certain specified stipulations. Descriptions of these endowed scholarships may be found below (page 281).

TUITION LOANS

Where a student's need for financial aid is not fully met by the free tuition scholarship award granted him, further aid may be granted in the form of a tuition loan to supplement the free tuition award. Under some circumstances, only a tuition loan is granted the applicant.

New students must meet the same qualifications to secure a tuition loan as to receive a tuition scholarship as described above. If an applicant's scholastic rating did not qualify him for a free tuition award adequate to cover his tuition needs, the supplementary tuition loan may still enable him to attend Lehigh University. Where it is deserved, this supplementary award generally will be made to the student without further application by him.

For students who have completed two or more semesters in residence at Lehigh, tuition loans are made on the basis of merit and need, at the discretion of the committee on scholarships and loans, and to the extent that loan funds are available.

No loan can be made to a student on scholastic or disciplinary probation. The maximum indebtedness to the University that any student may normally incur is $1000.00.

The student signs a note for any tuition loan, endorsed by his parent or guardian, agreeing to start repayments within three months from the date of his leaving the University for whatever cause, and at the rate of at least $20.00 per month until the full amount of the total indebtedness has been repaid.

Time Limit for Repayment. Every student incurring indebtedness to the University is required to undertake to pay his debt in full within five years after his graduation or withdrawal, according to a schedule to be agreed upon. In cases involving the maximum debt of $1000.00, the payment of the principal, at the rate of at least $20.00 per month, should be completed within four years and five months. All payments are applied first to the reduction of the principal of the debt.

Interest on Tuition Loans. Indebtedness incurred through tuition loans bears no interest so long as the student is in residence. From the date of graduation or withdrawal, such indebtedness bears interest at the rate of 3% for the first and second years, 4% the third and fourth years, and 5% thereafter.

DESCRIPTIONS OF ENDOWED SCHOLARSHIPS

The Ray Sands Nostrand Memorial Scholarship

The Ray Sands Nostrand Memorial Scholarship was established by the late Benjamin Nostrand, Jr., M.E., '78, in memory of his son, Ray Sands Nostrand, '17. The income from this fund is awarded to students of the University. The requirements governing the awards of University scholarships apply likewise to this scholarship.

The Fred. Mercur Memorial Fund Scholarship

Friends of the late Frederick Mercur, of Wilkes-Barre, Pa., General Manager of the Lehigh Valley Coal Company, desiring to establish a memorial of their friendship and esteem, and to perpetuate his memory, contributed and placed in the hands of the trustees of the University a fund called the Fred. Mercur Memorial Fund. The income from this fund is awarded to students of the University. The requirement governing the award of University scholarships apply likewise to this scholarship.

The Henry S. Haines Memorial Scholarship

Mrs. Henry S. Haines, of Savannah, Ga., established in 1889 a scholarship of the annual value of $100.00 as a memorial to her son, Henry Stevens Haines, M.E., '87. By the terms of the bequest this scholarship is awarded to a student in the curriculum in mechanical engineering. The requirements governing the award of University scholarships apply likewise to this scholarship.

The William S. Cortright Memorial Scholarship

Mrs. William S. Cortright established in 1938 a fund, the income from which provides a scholarship annually in memory of her husband, who graduated from Lehigh University in 1872. By the terms of the bequest this money is to be used for the maintenance of a part-tuition scholarship, to be awarded to a student who is a resident of Bethlehem or the immediate vicinity and who is enrolled in the curriculum of mechanical engineering. The award is to be made by the committee on scholarships and loans under the regular requirements governing the award of other University scholarships.

The Natt Morrill Emery Scholarship

Established in memory of the late Natt Morrill Emery, vice-president and controller of Lehigh University, by an alumnus and former student of Dr. Emery's, the Natt Morrill Emery Scholarship covers the full tuition fee. It will be awarded by Lehigh University every four years (or whenever it becomes vacant) from 1940 to 1956 inclusive to that graduate of the high schools of Richmond, Virginia, selected by the Richmond school authorities, who during his scholastic career has exemplified in character and conduct the qualities of loyalty and ability which marked the services of Dr. Emery to Lehigh University.

The Murtha P. Quinn Scholarship

Mr. Murtha P. Quinn left one-thirtieth of his residual estate to Lehigh University for the purpose of establishing a free tuition scholarship in the amount of $400.00 annually. Preference is to be given to students whose homes are in South Bethlehem.

Scranton Public High School Scholarships

Four scholarships, provided through the gifts of a friend of Lehigh University, are to be awarded, one each year, to graduates of the public senior high schools of Scranton, Pennsylvania, of which there are now two, viz: Central High School and Technical High School. The scholarship is to cover the tuition fee of the holder thereof.

A scholarship award is to be renewed yearly to the initial holder thereof until he graduates, provided he remains in school and maintains a grade at least equal to the average of his class during the preceding year.

The following qualifications only are to be the basis of the award of the scholarships: (a) a good character; (b) need of pecuniary assistance; (c) high scholastic ability. The awarding of these scholarships will be administered through the committee on scholarships and loans.

At the discretion of the president, each scholarship may be divided into two or more partial scholarships totaling one full scholarship, so that two or more may benefit by any annual award.

If at any time the income from the funds should warrant, two scholarships may be awarded in one year. If at any time the accumulated income is not sufficient to pay the full amount of the tuition fee, the scholarship shall be awarded nevertheless, the balance being taken from the principal of the fund.

The Luther Rees Zollinger Memorial Fund

The sister of Luther Rees Zollinger left the residue of her estate to Lehigh University to establish this memorial fund to provide tuition scholarships for worthy students who are in need of financial assistance. The awards are to be made by the committee on scholarships and loans, under the regular requirements governing the award of other University scholarships.

The Samuel Foster York Memorial Scholarship Fund

This fund was established by Warren W. York, of the Class of 1924, as a memorial to his father, Samuel Foster York. The income is to be applied towards tuition scholarships for needy and worthy graduates of Allentown, Pennsylvania, secondary schools who desire to pursue business administration courses at Lehigh University. The award is to be made by the committee on scholarships and loans under the regular requirements governing the award of other University scholarships.

The Theophil H. Mueller Scholarship Fund

This fund was established by Theophil H. Mueller, an alumnus trustee of the University. The income is to be used to assist in defraying the expenses of some worthy student or students who are in need of financial assistance, provided, however, that if it is possible and advisable the student or students selected to receive such financial assistance shall be of the Moravian faith and preferably from Bethlehem, Pennsylvania, or its environs. Awards are to be made by the committee on scholarships and loans, under the regular requirements governing the awarding of other University scholarships.

The John R. W. Davis Memorial Scholarship Fund

This fund was established by Mrs. John R. W. Davis, of Seattle, Washington, in memory of her husband, John R. W. Davis, C.E., Class of 1891. The income is to provide for scholarships in civil engineering for meritorious students in need of financial assistance. Awards are to be made by the committee on scholarships and loans, under the regular requirements governing the awarding of other University scholarships.

LOAN FUNDS

The Eckley B. Coxe Memorial Fund

In memory of the late Eckley B. Coxe, trustee of the University, Mrs. Coxe established a fund, amounting to $70,000.00, the interest of which is used, under the direction of the trustees of the University and subject to such regulations as they may adopt, for the assistance of worthy students requiring financial aid.

The Frank Williams Fund

Frank Williams, B.S. '87, E.M. '88, who died in October, 1900, bequeathed to the University the greater part of his estate to found a fund, now amounting to $245,000.00, the income of which is lent to deserving students.

The Frazier and Ringer Memorial Fund

The Frazier and Ringer Memorial Fund was established in 1906 by the late Robert H. Sayre, in memory of Benjamin West Frazier, A.M., Sc.D., former professor of mineralogy and metallurgy, and Severin Ringer, U.J.D., former professor of modern languages and literature and of history, each of whom served

Lehigh University for one-third of a century. The income from the fund and payments made by former borrowers are available for loans to cover the medical and surgical care of worthy students.

The President's Fund

The President's Fund was established during the early years of the University for the help of deserving students. As payments are made by former beneficiaries, they are immediately available for the assistance of students of the University.

GRADUATE SCHOLARSHIPS AND LOANS

University Scholarships and Loans

The board of trustees has authorized the annual award of twelve free-tuition scholarships and twelve deferred-payment scholarship loans to graduate students, the former to be assigned on the basis of superior qualifications, the latter granted on the basis of qualifications and need.

In general these scholarships and scholarship loans are administered under the same regulations as scholarships and loans for undergraduates. Inquiries regarding them should be addressed to the dean of the Graduate School.

The William C. Gotshall Scholarships

A bequest from the late William C. Gotshall provides funds for six scholarships to be awarded annually to worthy graduate students in any branch of engineering offered at Lehigh University. Appointment is for one year, with an annual stipend of $1000.00. Recipients of these awards pay the regular tuition fees. No duties other than graduate study are required of the holders.

ENDOWMENT OF SCHOLARSHIPS

Undergraduate or graduate scholarships named to honor an individual or corporation may be established in perpetuity by arrangement with the board of trustees of Lehigh University. The income from this donation will be paid to the holder of the scholarship to be applied toward the payment of university fees. The University does not, however, guarantee that this income will be forever sufficient to pay such fees in full.

PRIZES

Owing to the decreased return on invested funds, the income available for payment of prize awards may be insufficient to pay the amounts originally designated and planned by the donor. The University reserves the right to make such adjustments as may be necessary.

The Wilbur Scholarship Prize

The Wilbur Scholarship Prize, founded in 1872 by the late E. P. Wilbur, provides the sum of $200.00 which is awarded annually to the sophomore with the best record for the sophomore year.

The John R. Wagner Award

The John R. Wagner Award was established by the widow of John R. Wagner, Lehigh, 1885, in memory of her husband. The sum of $15.00 is awarded on Founder's Day each year to the junior student in mechanical engineering whose scholastic record is the highest in his class in the freshman and sophomore years and whose character and life purposes are deemed deserving and worthy.

The Wilbur Prizes

A fund was established by the late E. P. Wilbur for distribution in prizes as the faculty might determine. The income from this fund is used at present to provide awards as follows:

Wilbur Prizes, Freshman Year—a first prize of $15.00 and a second prize of $10.00 to the highest ranking and second highest ranking freshman in mathematics; prizes of $15.00 each to the highest ranking freshman in English, German, and French.

Wilbur Prizes, Sophomore Year—prizes of $10.00 to the highest ranking sophomores in mathematics, English, and physics.

The John B. Carson Prize

An annual prize of $50.00 was established by Mrs. Helen Carson Turner, of Philadelphia, Pennsylvania, in memory of her father, John B. Carson, whose son, James D. Carson, was a graduate of the civil engineering curriculum of Lehigh University in 1876. It is awarded to that senior in civil engineerng who shows the most marked excellence in the professional courses of his curriculum.

The William H. Chandler Prizes in Chemistry

Four annual prizes of $25.00 each, one in each class, for excellence in the curricula in chemistry and chemical engineering, were established by Mrs. Mary E. Chandler, of Bethlehem, Pennsylvania, widow of Dr. William H. Chandler, who was professor of chemistry at Lehigh University from 1871 until his death in 1906. In memory of Dr. Chandler the faculty named the prizes the William H. Chandler Prizes in Chemistry.

The Electrical Engineering Prize

An annual prize of $15.00, established by an anonymous graduate of the curriculum in electrical engineering, is awarded to the member of the sophomore class in electrical engineering having made the best record in the work of the sophomore year.

The Philip Francis duPont Memorial Prize in Electrical Engineering

The Philip F. duPont Memorial Prize Fund was established in 1929 by L. S. Horner, E.E. '98. The annual income of this fund is awarded each year in the way of prizes, two-thirds to the highest ranking senior and one-third to the second highest ranking senior in electrical engineering.

The Horn Prizes

The heirs of Harold J. Horn, E.E. '98, established a fund, the income of which is used in the award of a first and second prize of $10.00 and $5.00 respectively for the best work in the senior electrical engineering pro-seminar.

Alumni Prizes

Funds are provided by the Alumni Association for the annual award of four prizes of $25.00 each. Two prizes are awarded to the highest ranking juniors in the College of Engineering, one to the highest ranking junior in the College of Arts and Science, and one to the highest ranking junior in the College of Business Administration.

The Williams Prizes in English

The late Professor Edward H. Williams, Jr., an alumnus of the University of the class of 1875, established prizes for excellence in English composition and public speaking. The freshman, sophomore, and junior prizes are awarded by the faculty on the recommendation of the department of English.

SOPHOMORE COMPOSITION PRIZES. A first prize of $50.00, a second prize of $25.00, and a third prize of $15.00 are awarded annually for the three best compositions submitted by sophomores of regular standing as required work in their English courses.

JUNIOR COMPOSITION PRIZES. A first prize of $50.00, a second prize of $25.00, and a third prize of $15.00 are awarded for the three best essays submitted by juniors as part of the required work in their courses in English.

The Williams Senior Prizes

The Williams Senior Prizes are awarded by the faculty on the recommendation of the committee on Williams Senior Prizes.

1. First prizes of $100.00, second prizes of $50.00, and third prizes of $25.00 are awarded annually in each of the five fields of economics, English, philosophy, psychology, and history and government for dissertations submitted by regular members of the senior class on or before April 15.

2. The committee on Williams Senior Prizes publishes, before the close of the academic year, a list of recommended subjects for dissertations; but a senior may submit a dissertation upon any other subject in the respective field if the subject has received the approval of the committee.

3. Each senior entering the competition shall submit to the committee his choice of subject and plan of work by November 15.

4. The awards are made by the faculty upon recommendation of the committee, but no award is made if in any case a dissertation does not meet the standards of merit established by the committee. This standard includes such points as excellence in thought, plan, development, argument, and composition.

The Williams Prizes in Intramural Debating

Sums totalling $200.00 are awarded annually as prizes in intramural debating. Students engaged in this activity are organized under the direction of the department of English into teams, which compete as units in a series of debates held throughout the year. The sum of $120.00 is divided equally between the two members of the winning team, the sum of $80.00 between the two members of the runner-up. Winners of first prizes may not compete in the next succeeding year.

The Williams Prizes in Extempore Speaking

A first prize of $50.00 and a second prize of $25.00 are awarded to freshmen of regular standing who excel in a contest in extempore speaking held in May of each year.

A first prize of $75.00, a second prize of $50.00, and a third prize of $25.00 are awarded annually to the winners in a contest in extempore speaking for sophomores, juniors, and seniors. Winners of first prizes are not eligible to compete in subsequent years.

The Robert W. Blake Memorial Prizes

The Robert W. Blake Memorial Prizes are awarded at the Founders' Day exercises to freshmen enrolled in the program for general education. The prize committee (for the advisory council for general education) is composed of Professors Palmer and Diamond. The income from the Robert W. Blake Memorial Fund is devoted to the purchase of books awarded as prizes on conditions prescribed by the advisory council for general education.

The Goodman Prize in Fine Arts

An annual prize of $25.00 has been provided by Mrs. David J. Goodman, to be awarded to a student enrolled in the department of fine arts. Any student is eligible for the prize who has taken two semesters of work in the department of fine arts and has shown special ability in creative work or in critical appreciation in the field, as demonstrated by his classroom work and personal achievement. No student may be awarded the prize more than once.

The Irving Samuels Prize

An annual prize of $25.00 has been provided by Abram Samuels III, B.S. in Bus. Adm. '42, in memory of his father, the late Irving Samuels, E.E. '13. This prize is awarded on Founders' Day to the highest-ranking freshman in the College of Business Administration.

The Allen S. Quier Prize in Metallurgy

An annual prize of $15.00 has been provided by the daughters of the late Allen S. Quier in memory of their father, to be awarded to the senior who is adjudged by the staff of the department of metallurgical engineering to have made the most progress in his work in that curriculum. While high scholastic standing is a requisite, the prize is awarded on the basis of progressive achievement in scholastic work, rather than an average rating.

Scholarship Cups

Phi Sigma Kappa Scholarship Cup. A scholarship cup, to be awarded for one year to the fraternity in the interfraternity council having the highest scholastic average for the preceding year and to become the permanent property of the fraternity winning it for three successive years, was provided by an alumnus of the Nu Chapter of Phi Sigma Kappa social fraternity in 1923. This cup was retired upon presentation to the Tau Delta Phi fraternity on Founder's Day, 1947, the winning group having had the highest scholastic average among those eligible for the prize for three successive years.

A new cup, to be known also as the Phi Sigma Kappa Scholarship Cup and to be awarded on the same terms as the original, has been provided by the local chapter of Phi Sigma Kappa.

Trustees' Scholarship Cup. The trustees of the University have provided a scholarship cup which is awarded for one year to the living group having the highest scholarship average for the preceding year. The trustees' scholarship cup becomes the permanent property of any living group winning it for three successive years.

Prizes Awarded by Student Organizations

Tau Beta Pi Prize. The Tau Beta Pi honorary engineering fraternity awards each year a slide rule or other prize of equivalent value to the technical freshman having the highest scholastic average.

Eta Sigma Phi Prize. The Eta Sigma Phi classical fraternity awards a cash prize of $10.00 to that student doing the best work in sophomore collegiate Latin.

Pi Tau Sigma Prizes. The Pi Tau Sigma honorary fraternity in mechanical and industrial engineering awards each year a mechanical engineers' handbook to the highest ranking freshman in the curricula in mechanical engineering and industrial engineering respectively.

Eta Kappa Nu Prize. The Eta Kappa Nu honorary fraternity in electrical engineering awards a handbook in electrical engineering to the highest ranking freshman in the curriculum in electrical engineering.

American Society of Civil Engineers Junior Membership Prize. The Lehigh Valley Section of the American Society of Civil Engineers offers a prize of a junior membership in the American Society of Civil Engineers to the highest ranking senior in civil engineering holding membership in the student chapter.

American Society of Mechanical Engineers Junior Membership Prize. The Anthracite-Lehigh Valley Section of the American Society of Mechanical Engineers awards annually a prize of the value of $10.00 to an outstanding member of the Lehigh Student Branch of the ASME. This prize takes the form of junior membership for one year in the parent society.

American Chemical Society Award. The Lehigh Valley Section of the American Chemical Society awards a membership in the American Chemical Society and a subscription to a journal of this society to the highest ranking senior in chemistry or chemical engineering.

American Institute of Chemists Medal. The American Institute of Chemists has established annual student medal awards to senior students majoring in chemistry in designated institutions. Each award carries with it a junior membership in the American Institute of Chemists.

Alpha A. Diefenderfer Award. In recognition of Professor Emeritus Alpha Albert Diefenderfer's long service as faculty adviser to the organization, the Lehigh University Chemical Society established in 1947 the Alpha A. Diefenderfer Award for the highest ranking sophomore in analytical chemistry. Each winner is presented with an engraved certificate, and his name is inscribed on a plaque given by the Society and displayed in the Chemistry Building.

Alpha Kappa Psi Medallion. The Alpha Kappa Psi professional fraternity in commerce awards a medallion each year to the highest ranking senior in the College of Business Administration.

ORGANIZATIONS

Honorary Scholarship Societies

PHI BETA KAPPA. Students in the College of Arts and Science and the College of Business Administration who, up to the middle of the senior year, maintain high scholarship may be elected to membership; also a limited number of engineering students whose work in philosophical, scientific, and language studies is of high grade.

TAU BETA PI. This national honorary society, which now has seventy-one chapters, was founded at Lehigh University in 1885 by Professor E. H. Williams, Jr. Students in the College of Engineering may be elected to membership during their junior and senior years if they have maintained high scholarship.

SIGMA XI. Election to membership is based upon the completion of original and noteworthy research in pure or applied science and the publication of the results thereof. Ordinarily undergraduates are eligible to associate membership only, their election being based upon their promise of achievements in scientific research.

Other Honorary Scholarship Societies

ALPHA EPSILON DELTA (pre-medical)
ETA KAPPA NU (electrical engineering)
ETA SIGMA PHI (classics)
PHI ALPHA THETA (history)
PHI ETA SIGMA (freshman)
PI MU EPSILON (mathematics)
PI TAU SIGMA (mechanical engineering)
ROBERT W. BLAKE SOCIETY (philosophy)

Course Societies

Intellectual interest in various fields of study and professional spirit among pre-medical, business, and engineering students is promoted by a group of organizations commonly called course societies. The first of these organizations historically was the Chemical Society, established in 1871. The list now includes:

In Arts and Science

Ernest W. Brown Astronomical Society
Circulo de Español
Delta Omicron Theta (debating)

Der deutsche Verein
Robert W. Hall Pre-Medical Society
International Relations Club
Newtonian Society (mathematics)
Psychology Club

In Business Administration

Alpha Kappa Psi (professional fraternity in business administration)
Lambda Mu Sigma (marketing)

In Engineering

Chemical Society
Student Chapter of the American Society of Civil Engineers
Howard Eckfeldt Society (student branch of the American Institute of Mining and Metallurgical Engineers)
Electrical Engineering Society (student branch of the American Institute of Electrical Engineers)
Mechanical Engineering Society (student branch of the American Society of Mechanical Engineers)
Metallurgical Society
Physics Society

Other Organizations

Other student organizations include:

Alpha Chi Epsilon (Episcopal pre-theological honorary society)
Alpha Lambda Omega (Allentown group)
Alpha Phi Omega (national service scouting fraternity)
American Ordnance Association (Lehigh Post)
American Veterans Committee
Arcadia (student self-government council)
Bridge Club
Brown Key Society
Camera Club
Canterbury Club
Chapel Choir
Chess Club
Chinese Students Club
Combined Musical Clubs
Cosmopolitan Club
Cut and Thrust Society (fencing)

Cyanide Club (junior honorary society)
DeMolay Club
Flying Club
Glee Club
Golf Club
Interdormitory Council
Interfraternity Council
Lehigh Collegians (dance orchestra)
Lehigh University Band
Mustard and Cheese (dramatic club)
National Society of Pershing Rifles
Newman Club
Omicron Delta Kappa (senior honorary fraternity)
Ornithological Society
Pi Delta Epsilon (honorary journalistic fraternity)
Pi Gamma Mu (social studies)
Political Science Assembly
Radio Club
Sailing Club
Scabbard and Blade (honorary military fraternity)
*Scalp and Blade
Ski Club
*Spiked Shoe (honorary fraternity, track athletics)
Sportsmen's Club
Student Chapel Society
Symphony Orchestra
Tone (music)
Town Council
Varsity "L" Club
WLRN (Radio Brown and White)

The following Greek letter fraternities have chapters at Lehigh University: Alpha Chi Rho, Alpha Sigma Phi, Alpha Tau Omega, Beta Theta Pi, Chi Phi, Chi Psi, Delta Phi, Delta Sigma Phi, Delta Tau Delta, Delta Upsilon, Kappa Alpha, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Sigma Kappa, Pi Kappa Alpha, Pi Lambda Phi, Psi Upsilon, Sigma Alpha Mu, Sigma Chi, Sigma Nu, Sigma Phi, Sigma Phi Epsilon, Tau Delta Phi, Theta Chi, Theta Delta Chi, Theta Kappa Phi, Theta Xi.

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*Inactive during 1948-1949.

Student Publications

The students of Lehigh University publish a semi-weekly college newspaper, *The Lehigh Brown and White*; a quarterly magazine, *The Lehigh Goblet*; and a year book, *The Epitome.*

ALUMNI ASSOCIATION

The Alumni Association, which has been in existence since 1876, was incorporated in 1917 under the name of the Alumni Association of the Lehigh University, Inc. The offices of the association are in the Alumni Memorial Building. Along with the regular alumni activities, the association is largely concerned with raising money to meet the needs of the University.

The officers of the Alumni Association for 1948-49 are:

President, Monroe J. Rathbone, '21, New York, N. Y.

Vice-President, Warren W. York, '24, Allentown, Pa.

Vice-President, Edward A. Curtis, '25, Washington Crossing, Pa.

Treasurer, R. S. Taylor, Sr., '95, Bethlehem, Pa.

Archivist, Arthur W. Klein, '99, Bethlehem, Pa.

Executive Secretary and Editor of the *Lehigh Alumni Bulletin,* Leonard H. Shick, '37, Bethlehem, Pa.

The following are the alumni clubs: New York Lehigh Club, Philadelphia Lehigh Club, Pittsburgh Lehigh Club, Chicago Lehigh Club, Washington, D. C., Lehigh Club, Detroit Lehigh Club, Cincinnati Lehigh Club, Northeastern Pennsylvania Lehigh Club (Scranton and Wilkes-Barre, Pa.), Maryland Lehigh Club (Baltimore, Md.), Youngstown (O.) Lehigh Club, Lehigh Club of New England (Boston, Mass.), Lehigh Club of Central Pennsylvania (Harrisburg, Pa.), Lehigh Club of Northern New York (Schnectary, N. Y.), Lehigh Club of Central New York (Rome, N. Y.), Lehigh Club of Northern Ohio (Cleveland, O.), Lehigh Club of Southern New England (Hartford, Conn.), Lehigh Club of Western New York (Buffalo, N. Y.), Lehigh Home Club (Bethlehem, Pa.), Lehigh Club of Southeastern Pennsylvania (Reading, Pa.), Lehigh Club of Central Jersey (Trenton, N. J.), Lehigh Club of York-Lancaster (Pa.), Lehigh Club of Northern New Jersey (Newark), Lehigh Club of Northern California (San Francisco), Lehigh Club of Southern California (Los Angeles, Lehigh Club of Delaware Wilmington), Lehigh Club of Monmouth County, N. J.

BUILDINGS AND GROUNDS

The University occupies twenty-three buildings which are located on a tract of land covering one hundred eighty acres on the north side of South Mountain, overlooking the valley of the Lehigh River and the City of Bethlehem. In addition, the University has an athletic field, seven and one-half acres in area, with field house, gymnasium, and covered grandstand, located about a mile from the University campus.

Packer Hall

Packer Hall is a four-story sandstone building, 215 feet long and 60 feet wide.

The department of civil engineering occupies the greater part of the first and second floors. The instrument rooms contain transits, levels, a large geodetic theodolite, plane tables, and other instruments for engineering field work. In the department headquarters is a collection of plans of engineering structures.

The departments of mathematics and astronomy, philosophy, and psychology also are located in this building. The psychology laboratory has the standard equipment for the several courses in experimental psychology and for research.

The Chemistry Building

The Chemistry Building is a three-story fire-proof sandstone edifice, 259 feet long and 44 feet wide, with a wing 62 feet long and 42 feet wide, and with a three-story extension, 60 feet long and 37 feet wide. An additional three-story wing, 116 feet long by 52 feet wide, has been added to the east of the original building.

Laboratory space and equipment are provided for qualitative and quantitative analysis, inorganic chemistry, organic chemistry, sanitary chemistry, industrial biochemistry, colloid chemistry, X-ray analysis, gas analysis, the furnace assay of ores, industrial chemistry, chemical engineering, and research in chemistry and chemical engineering.

The trustees of the University named this building, exclusive of the new east wing, the William H. Chandler Chemistry Laboratory in recognition of Dr. Chandler's thirty-five years' service as professor of chemistry, 1871-1906. The east wing was named the Harry M. Ullmann Chemistry Laboratory, in recognition of Dr. Ullmann's service as head of the chemistry department.

The Physics Building

The Physics Building is a four-story sandstone structure, 240 feet long and 44 to 56 feet wide. This building is devoted entirely to the department of physics. In addition to offices, recitation rooms, and lecture rooms, there are fully equipped laboratory rooms for undergraduate and graduate classes, a number of smaller laboratories for research, a reading room, machine shop, wood-working shop, glass-blowing room, constant-temperature rooms, storage battery room, sound-proof room, and dark rooms. The building is equipped throughout with water, gas, compressed air, and electric power outlets.

The W. A. Wilbur Engineering Laboratory and Power House

The W. A. Wilbur Engineering Laboratory and Power House is a two-story sandstone building, 188 feet long and 44 feet wide.

The power plant contains four Babcock and Wilcox straight-tube cross-drum boilers, each rated at 300 boiler horse-power, four Coxe chain grate stokers, two turbine-driven Sturtevant blowers, and coal-, water-, and ash-handling equipment of modern design.

The plant is designed and equipped to provide steam at 250 pounds pressure to the engineering laboratories, in addition to heating the University buildings. It is so arranged that any boiler can be isolated for laboratory tests for long periods if necessary. From this plant a six-inch line carries steam to the Packard Laboratory at the pressure desired for the laboratory work. Modern safety appliances and measuring equipment have been incorporated.

A coal-storage yard has room for two months' supply of coal, and a system of belt-conveyors and bucket-elevators is provided for receiving coal, dumping it on the storage pile, and conveying it into the boiler room as needed.

Williams Hall

Williams Hall, the donation of Dr. Edward H. Williams, Jr. of the class of 1875, was so named by the trustees of the University in recognition not only of this gift but also of Dr. Williams' long continued and important service to the University as professor of mining and geology.

Williams Hall is a three-story brick building, 186 feet long and 70 feet wide. It contains the offices, class rooms, laboratories, departmental libraries, and museum collections of the departments of biology, geology, and metallurgical engineering.

The Fritz Engineering Laboratory

The late John Fritz, of Bethlehem, known as the father of the steel industry in the United States, a member of the University's original board of trustees, gave to the University funds for the erection and thorough equipment of an engineering laboratory. The building, which was designed and erected under the personal supervision of Mr. Fritz, is used by the department of civil engineering for various research projects and for laboratory work in connection with instruction in the mechanics of materials, hydraulics, and properties of cement and concrete.

The structures and materials section provides one of the outstanding laboratories of the country. Located in the main central bay, about 62 feet by 43 feet in plan, it is serviced by a ten-ton overhead crane and has a variety of universal testing machines, ranging in capacities from 20,000 to 800,000 pounds, including several of the most recent design. A special laboratory is maintained for undergraduate instruction in materials testing. Machines for torsion, repeated stress, impact, bend, and hardness tests are also available. The laboratory has strain- and deformation-measuring apparatus of all types.

The hydraulics laboratory has two levels, each 36 feet by 49 feet in plan. On the lower level are pumps, tanks, turbines, weirs, and appropriate apparatus used both for student instruction and industrial tests. Separate tanks and a circulating system with appropriate meters are available for oil flow studies. The upper level, except where cut through by high-pressure constant-head storage tanks, is largely available for special large size spillway or river model tests.

The laboratory machine shop is completely equipped with lathes, millers, drill-presses, grinders, power saws, and miscellaneous tools and equipment. The welding shop provides both electric arc and resistance welding.

The laboratory for making and storing plain and reinforced concrete test specimens is 36 feet by 29 feet in plan and includes storage bins for aggregate, together with equipment for making and storing all types of plain and reinforced concrete specimens.

Other facilities include photoelastic stress analysis equipment, a metallographic laboratory, offices for the staff, and a photographic dark room.

The Eckley B. Coxe Mining Laboratory

The Eckley B. Coxe Mining Laboratory is a two-story sandstone building, 100 feet long and 75 feet wide. It is occupied exclusively by the department of mining engineering.

The building contains the offices of the department of mining engineering, a recitation room, a drafting room, a locker and wash room, a laboratory equipped for fuel research, a balance room, and a shop.

On the lower main floor are two air compressors, rock drills, and a motor-generator set. The upper main floor has one section for crushing, grinding, and the preparation of samples, and for making sieving tests. The remainder of this floor is equipped with units for elementary and advanced laboratory work in ore dressing and coal preparation—ball mills, a rod mill, classifiers, jigs, concentrating tables, flotation machines, magnetic separators, and a Chance coal cleaner, together with auxiliary equipment such as float-and-sink apparatus, ore-dressing microscope, etc.

The lower second floor is equipped as a laboratory for the necessary analytical work in connection with ore dressing and coal preparation, and as a fuel technology laboratory for coal, gas and oil analysis. Part of the upper second floor is used as a departmental drafting room in connection with the courses in mine surveying and mining methods; the remaining portion is being equipped as a mine ventilation laboratory.

The laboratory was named by the trustees of the University in memory of Eckley B. Coxe, who was a pioneer and a leader in the profession of mining engineering in this country, and an active friend and valued trustee of the University from its early days until his death.

Christmas-Saucon Hall

Christmas-Saucon Hall is a three-story stucco building. It contains the office of the College of Business Administration, the offices, lecture rooms, and recitation rooms of the departments of English, accounting, economics and sociology, and finance, and the University Counseling Center. Christmas Hall has historic interest as the first building of Lehigh University.

Coppee Hall

Coppée Hall is the headquarters of the College of Arts and Science. It contains the offices of the College of Arts and Science, a lecture room, and the offices and recitation rooms of the departments of German, Latin, Greek, romance languages, history and government, international relations, and fine arts.

Sayre Observatory

The Sayre Observatory was the gift of the late Robert H. Sayre, one of the original trustees of the University.

The observatory contains an equatorial telescope of six inches clear aperture and of eight feet focus, by Elvin Clark; a zenith telescope of four and one-half inches clear aperture; an astronomical clock by William Bond & Son; a meridian circle; a prismatic sextant by Pistor and Martins; an engineer's transit and a sextant by Buff and Buff. Students in practical astronomy receive instruction in the use of the instruments and in observation.

The land upon which the observatory stands, consisting of seven acres adjoining the original grant, was presented to the University by the late Charles Brodhead, of Bethlehem.

The Packer Memorial Church

The Packer Memorial Church, in which religious services are held, was the gift of the late Mrs. Mary Packer Cummings, daughter of the founder of the University. It was built in 1887. Occasional musical recitals and the annual Bach Festival are held in this building.

The University Library

The University Library is a five-story building of native stone, with limestone trim, in the collegiate Gothic style of architecture. It incorporates the original library building, erected in 1877 by Asa Packer and named in memory of his daughter, Lucy Packer

Linderman, and a completely modern edifice built in 1929 with funds contributed by alumni.

The main floor of the new portion of the building is occupied by the general reading room with its two alcoves, offices of the library staff, and the lobby, where are located the loan desk, card catalogue, and serial indexes. On the upper floors of this portion of the building are eleven seminar rooms, the Treasure Room, the Lehigh Collection, and the Lehigh Art Gallery. On the ground floor is the Browsing Room, a large pleasant room furnished with easy chairs and an assorted collection of books, where students may read in an atmosphere of relaxation. The remainder of the new wing and the entire older portion of the building are occupied by stacks. In the stacks are a number of cubicles, which may be reserved by students and faculty members engaged in special work.

Eugene Gifford Grace Hall

Eugene Gifford Grace Hall, named for the donor and devoted to sports and recreation, is a stone edifice, approximately 120 feet wide and 180 feet long. The building contains a sports theater, which also serves as an assembly room for the University, with a seating capacity of about 3000, and a large drill floor, which is also available for the larger University dances and receptions. In addition, there are rooms for the band, orchestra, and athletic teams, and classrooms and offices for the department of military science and tactics. Promenade terraces at the level of the dance floor on three sides of the building afford views over the Lehigh Valley and of South Mountain.

Dravo House

Dravo House, a five-story fireproof dormitory completed in April, 1948, provides accommodations for 340 students. The building was made possible by the alumni and friends of the University through their contributions to the Progress Fund. Each of the four wing structures which compose the building has its own lounge and game rooms; and the center unit has a lounge and reception room for visiting friends, in addition to a ladies' lounge. There are rooms for two, three, and four students. Rates for each occupant range from $80.00 to $120.00 per semester.

The Henry Sturgis Drinker House

The Henry Sturgis Drinker House, a four-story fire-proof dormitory completed in September, 1940, provides accommodations for 194 students. It has rooms for two and three, suites for four, a spacious lounge, and a reception room for visitors. Rates for each occupant range from $50.00 to $90.00 a semester.

The Henry Reese Price House

The Henry Reese Price House, named in honor of Dr. Henry Reese Price, an alumnus of the University of the class of 1870 and late president of the board of trustees, furnishes dormitory accommodations for fifty-four students. The rates vary from $25.00 to $60.00 a semester.

The Charles Russ Richards House

The Charles Russ Richards House, which was completed in September, 1938, is a four-story fire-proof dormitory with rooms for two and three and suites for four students. In addition to bedrooms and studies accommodating a total of 217, the building contains an adequate recreation room, a spacious lounge, and two reception rooms for visiting friends. The rates are $50.00 to $90.00 per semester for each occupant.

The Charles Lewis Taylor House

The Charles Lewis Taylor House, the gift of Mr. Andrew Carnegie, is a three-story concrete dormitory with accomodations for 218 students, the majority of whom are housed in three-room suites, four to each suite. The building was named Taylor Hall by Mr. Carnegie in honor of Charles L. Taylor, his former partner in business, a graduate of the University of the class of 1876 and a trustee of the University. Room rent in this dormitory is from $25.00 to $60.00 per semester.

Drown Memorial Hall

Drown Memorial Hall was erected by friends and alumni as a memorial to the late Thomas Messinger Drown, LL.D., president of the University from 1895 to 1904. The building is devoted to the social interests of the University family. It contains study, reading, and lounging rooms, an assembly hall, the offices of Arcadia (student governing body) and of the college publications, and club rooms for the dramatic and musical organizations.

It also houses the scores, records, and phonograph of the College Music Set, the gift of the Carnegie Foundation.

Alumni Memorial Building

The Alumni Memorial Building, which is used as the administration building of the University, was erected as a memorial to 1,921 Lehigh men who served in the World War, and especially to the forty-six who gave their lives. The cost of erection was raised by subscription from about 1,700 alumni. The Memorial Hall contains the records of the Lehigh men who served and those who died, together with mementos of the war.

In the south wing of the building are the offices of the president, the dean of students, the registrar, the superintendent of buildings and grounds, and the director of placement. The north wing contains the offices of the treasurer, the bursar, the associate and assistant directors of admissions, the accountant, the department of public relations, and the alumni association, and the University supply bureau.

Taylor Gymnasium and Field House

In 1913, Charles L. Taylor, E.M., '76, donated to the University the funds required for the erection of a gymnasium and field house.

Taylor Gymnasium adjoins the athletic field. The building is 222 feet long and 73 feet wide. On the ground floor is located the game room, 93 by 70 feet, used for basketball and wrestling. The game room is surrounded by a gallery for spectators. The main gymnasium floor measures 90 by 70 feet. Other rooms in Taylor Gymnasium are the offices of the division of intercollegiate athletics, staff offices and measuring room of the department of physical education and intramural athletics, basketball and handball courts, fencing, boxing, and wrestling rooms, and locker rooms.

The gymnasium is equipped with modern appliances for individual and class work in recreative and corrective exercises, calisthenics, and other gymnastics. Adjoining the locker rooms is a swimming pool, 75 by 25 feet, ranging from four and one-half to nine and one-half feet in depth.

Adjoining the gymnasium and the stadium is the Taylor Field House. It is three stories in height and has dressing rooms, lockers and shower baths for visiting and Lehigh teams. The third floor addition is known as the Samuel E. Berger Room and was built with funds given by Mr. Samuel Erwin Berger, B.A., '89.

Taylor Field

An athletic field more than nine acres in area is provided for the accommodation of students who participate in the various outdoor sports. The stadium, located on the lower level, provides football and baseball fields, surounded by concrete stands having a seating capacity of 12,000. On the upper level there is a practice field for football, baseball, lacrosse, and soccer; also a quarter-mile track and a 220-yard straight-away. During the winter months a wooden outdoor running track, twelve laps to the mile, is provided.

Lehigh Field and Field House

An additional athletic field seven and one-half acres in area, with field house, gymnasium, and covered grandstand, is located about a mile from the University campus. The field house has dressing rooms, lockers, and shower baths; the gymnasium is equipped with basketball and volley ball courts. Here are eleven tennis courts for intercollegiate and intramural tennis. This field includes a playing ground for intercollegiate soccer and a field for intramural baseball and other intramural activities.

Lamberton Hall

The first floor of this building contains the main dining hall for student use and a private dining room, together with a complete kitchen and cafeteria counter. The second floor has a large dining room, pantry and service rooms. Storerooms and service rooms for help are located in the basement.

A portion of the basement is used by the military department as a rifle range. This portion contains two indoor rifle and pistol ranges.

The James Ward Packard Laboratory of Electrical and Mechanical Engineering

The late James Ward Packard, who was graduated from Lehigh University in 1884 with the degree of mechanical engineer, the designer of the first Packard motor car and founder of the Packard Motor Car Company of Detroit, Michigan, and of the Packard Electric Company of Warren, Ohio, donated $1,200,000.00

for the erection and equipment of an electrical and mechanical engineering laboratory, which was completed in 1929.

This building, named for the donor, is a five-story steel-framed sandstone structure 225 feet long and 180 feet wide. The lobby is finished in Italian travertine. The halls throughout the building are wainscoted with Tennessee marble. An auditorium on the first floor with a seating capacity of 622 is equipped with still- and motion-picture apparatus.

The western half of the building contains the offices, class rooms, research rooms, and laboratories of the department of electrical engineering. The main dynamo laboratory contains more than 100 generators and motors of various types. The high-tension laboratory is equipped with a 150 kv. and a 60 kv. testing transformer, a 700 kv. oscillation transformer, and a source of high direct current voltage up to 100 kv. The transients laboratory is provided with six magnetic oscillographs, two cathode-ray oscillographs, two artificial transmission lines, a surge generator, and a photographic dark room. A five-unit harmonic phase-shifting motor-generator set supplies voltage of various frequencies and wave forms for special tests. The communications laboratory has extensive equipment of high-frequency measuring apparatus, vacuum-tube circuits, speech amplifiers, and a 40/80 meter transmitter (C.W. or phone) used by the radio club. The wiring system provides for quick communication and inter-connection between any two parts of the building. Transforming machinery and switchboard for the laboratory power supply are located in the basement.

The eastern half of the building houses the department of mechanical and industrial engineering, with offices, drawing rooms, class rooms, research rooms, a reading and study room, a photographic dark room, a shop, instrument rooms, and laboratories. The general laboratory comprises a series of air compressors, steam engines, turbines, and pumps, ranging from the simplest types to the modern turbo-generator. Each unit is provided with the necessary auxiliaries for testing. The internal combustion laboratory contains a range of modern internal combustion engines, arranged for connection to dynamometers so that determinations of efficiency and economy may be made readily. For the laboratory study of the principles of heating, ventilation, air conditioning, and refrigeration, there are available fully equipped house-heating units and a refrigeration laboratory. The latter contains ammonia, carbon dioxide, and freon compression systems and an aqueous ammonia absorption system.

Sayre Park

A development of the mountainside on the University grounds was effected through the donation in 1909 of the sum of $100,000.00 by the children of the late Robert H. Sayre, to be used in the development of Sayre Park as a memorial to their father, who was a trustee of the University from its foundation until his death in 1907.

The Arboretum

The Arboretum is a tract of about eleven acres adjoining Sayre Park. It was established by a friend of the University as a tree nursery for the purpose of furnishing illustrative specimens of American trees and of cultivating trees and shrubs for the beautifying of the park. All of the more important species of North American trees are to be found in the Sayre Park and the Arboretum. A tract of seven acres adjoining the Arboretum has been planted with a variety of indigenous trees as an exhibition growth of tree culture.

The Health Center

The Health Center, where the Students' Health Service is housed temporarily, is a rebuilt one-story frame structure, 151 feet long and 26 feet wide. In addition to offices and rooms for the personal use of members of the staff, the building contains a main and an auxiliary dispensary, a laboratory, an X-ray room, an ultra-violet room, dark rooms, a physiotherapy room, a sterilizing room, an audiometer room, and a large waiting room.

The Education Building

The Education Building, headquarters of the department of education, is a rebuilt, temporary one-story frame structure, 76 feet long and 30 feet wide. The building has a class room with a capacity of approximately thirty, a seminar room, and six offices.

The Ordnance Laboratory

The facilities of the department of military science and tactics, located in Eugene Gifford Grace Hall, have been augmented by a rebuilt, temporary one-story frame structure, 60 feet long and

25 feet wide. The building contains an ordnance laboratory, which can be used as a garage, and storage space.

Temporary Dormitories

Three rebuilt quonset-type frame buildings, each 125 feet long and 21 feet wide, provide temporary study and sleeping quarters for 120 students. A one-story concrete-block boiler room has been erected to supply heat for these three buildings.

Storage Buildings

Two rebuilt steel quonset huts, 96 by 20 feet, have been secured for use as storage buildings and work shops.

GENERAL REGULATIONS

Eligibility for Degree

In order to be graduated, a candidate for a baccalaureate degree must either receive a grade of C or better in at least half of the hours taken in residence and presented for graduation or attain an average of 1.80 or better for all hours taken in residence and offered for graduation.

To be eligible for a degree from Lehigh University, a student not only must have completed all of the scholastic requirements for the degree, but also he must have paid all University fees, and in addition all bills for the rental of rooms in the dormitories, or for damage to University property or equipment, or for any other indebtedness to the University. It is understood, however, that this regulation does not apply to any indebtedness for scholarship loans or for loans from trust funds administered by the University which are protected by properly executed notes approved by the treasurer.

Final Date for Completion of Requirements

For graduation all requirements, scholastic and financial, must have been met by 12 o'clock noon on the Friday preceding the graduation exercises.

Notice of Candidacy for Degree

Candidates for graduation on University Day file with the registrar on or before May 15 a written notice of candidacy for the degree; candidates for graduation on Founder's Day file a similar notice of candidacy on or before September 10; candidates for graduation at the Midyear Commencement file such notice on or before January 10. Failure to file such notice by the dates mentioned debars the candidate from receiving the degree at the ensuing graduation exercises.

Graduating Theses

Undergraduate theses, when required, are accompanied by drawings and diagrams, whenever the subjects need such illustration. The originals are kept by the University, as a part of the student's record, for future reference; but copies may be retained by students, and may be published, provided permission has first been obtained from the faculty.

Credit and Grades

Credit is reckoned in semester hours. A semester hour is a course unit involving a total of three clock hours of effort on the part of the student each week for a semester.

Final grades in courses are A, B, C, D, and F. A, B, C, and D are passing. F indicates failure. Physical education is marked P (passing) or F (failure) without hour credit.

In cases of withdrawal from courses after the tenth day of instruction the symbols WP (withdrawn, passing) and WF (withdrawn, failure) are used.

The letters "Abs." (absent) are used to indicate absence from a final examination in a course. The grade of "Abs." is reported with a letter grade in parentheses, such letter grade representing the department's estimate of the student's work up to the close of instruction, with the provision that in cases where a department does not feel justified in reporting an estimated grade, a report of "Abs. (X)" will be returned.

The letters "Inc." are used to indicate that the work in a course is incomplete. The grade is accompanied by a letter grade. A student who incurs an "incomplete" in any course and fails to remove the "incomplete" within one calendar year, loses all equity in the course.

HONORS

Honors are of three kinds: class honors, graduation honors, and special graduation honors.

Class Honors

Upon completion of the work of the freshman and sophomore years, on recommendation of the registrar and by vote of the faculty, class honors are awarded to those individuals who have made an average of 3.00 or better during the preceding year.

The names of these students are announced at the graduation exercises at the end of each semester and published in the University Register.

Graduation Honors

Degrees "with honors" are awarded by vote of the faculty to those students who have attained an average of not less than 3.00 in their last two years' work at the University.

Degrees "with high honors" are awarded by vote of the faculty to those students who have attained an average of not less than 3.50 in their last two years' work at the University.

Degrees "with highest honors" are awarded by vote of the faculty to those students who have attained 3.75 in their last two years' work at the university.

Candidates for graduation who have been in residence at the University for less than two years are not eligible for graduation honors.

Graduation honors are announced at the graduation exercises.

In computing the averages of candidates for graduation honors, semester grades are weighted according to the number of credit hours in the course concerned on the basis: A equals 4, B equals 3, C equals 2, D equals 1, and F equals 0.

Special Honors

Special honors are awarded at the end of the senior year, on recommendation of the head of the department concerned and by vote of the faculty, to students who have done advanced work of unusual merit in some chosen field. Candidates for special honors must indicate to the head of the department concerned and to the registrar during the junior year their intention to work for such honors. Awards are based on grades obtained in the subject chosen, the results in extra work assigned, and the general proficiency of the candidate as evidenced either by a final examination or a thesis, as the head of the department involved may direct. Special honors are announced at the graduation exercises.

ACADEMIC OBSERVANCES

Midyear Commencement 1948

Commencement exercises for the Class of February 1948 were held Sunday afternoon, February 1, 1948 in Eugene Gifford Grace Hall. Degrees were conferred and graduation honors were announced. The address to the members of the graduating class was delivered by Captain Edward Vernon Rickenbacker, President and General Manager of Eastern Airlines, Incorporated.

Baccalaureate Sunday

Baccalaureate services were held on Sunday morning, June 13, 1948 in Packer Memorial Church, with the Reverend George Martin Bean, University Chaplain, in charge. The sermon was delivered by the Right Reverend Frank William Sterrett, Bishop of Bethlehem.

University Day

University Day was observed Monday, June 14, 1948. Commencement exercises, which began at 10:30 A.M., were held in Eugene Gifford Grace Hall. The address to the graduating class was delivered by Eugene Gifford Grace, E.E., Eng.D., LL.D., Litt.D., Chairman of the Board of the Bethlehem Steel Company and President of the Board of Trustees of Lehigh University. Honorary degrees and degrees in course were conferred, commissions in the Officers' Reserve Corps were awarded, and graduation honors and prizes won by members of the graduating class were announced.

Founder's Day

The annual exercises in honor of the founder of the University were held Sunday afternoon, October 10, 1948 in the Packer Memorial Church. The address was delivered by Dr. Sumner Huber Slichter, Lamont University Professor, Harvard University. Degrees were conferred; and graduation honors, class honors, and prizes were announced.

LEHIGH INSTITUTE OF RESEARCH

The Lehigh Institute of Research was organized in 1924 to encourage and promote scientific research and scholarly achievement in every division of learning represented in the organization of the University, and in recognition of the need for further and more exact knowledge in science and in the application of science to the affairs of modern life. The institute was reorganized in 1945 in order to cooperate more effectively with industry and government agencies.

The purposes of the Institute of Research include the training of men for research work, the publication of results of investigations, the conduct of general research, the conduct of cooperative research, and the conduct of commercial tests and advisory service.

Detailed information concerning the organization and regulations of the Institute of Research will be provided by the director upon request.

RESEARCH FELLOWSHIPS

Graduates in appropriate curricula of colleges, universities, and technical schools whose requirements for graduation are substantially the same as those at Lehigh University are eligible to apply for appointment to any of the following research fellowships, as available, except the Student Chemistry Foundation Fellowship, which may be awarded only to a graduate of Lehigh University.

Appointment to these fellowships is for a period of two semesters and may be renewed, provided the work of the holder is of such quality as to justify the continuation of financial aid. Holders of the fellowships devote half their time to graduate study, and the other half to research work in the department to which they are assigned.

Graduate fellows pay the regular tuition fees. However, the Committee on Graduate Scholarships and Fellowships, in awarding a fellowship, may award at the same time a graduate tuition grant. The grant provides remission of all tuition fees during the period for which it is awarded.

A holder of a fellowship may not accept any employment for pay without the written permission of the dean of the Graduate School.

Candidates for fellowships must make application on blanks provided by the University on or before March 1. Requests for application blanks should be addressed to: Office of Admissions, Lehigh University, Bethlehem, Pa.

New Jersey Zinc Company Research Fellowship

The New Jersey Zinc Company provided funds in 1924 for a research fellowship to be known as the New Jersey Zinc Company Research Fellowship. Half of the time of the holder of this fellowship must be devoted to research work in the department to which he is assigned; the other half to graduate study leading to a master's degree.

The Henry Marison Byllesby Memorial Research Fellowships

In 1926 Mrs. H. M. Byllesby, widow of Col. H. M. Byllesby, M.E., '78, President of the Byllesby Engineering and Management Corporation, provided an endowment fund for the establishment of the Henry Marison Byllesby Memorial Research Fellowship in Engineering. Holders of these fellowships must devote half of their time to research work on some problem in electrical, mechanical, or hydraulic engineering, proposed by the president of the Byllesby Engineering and Management Corporation and approved by the Lehigh Institute of Research; the other half to graduate study leading to the degree of Master of Science. At the present time two awards can be made each year.

The James Ward Packard Research Fellowships in Electrical or Mechanical Engineering

The income from a bequest from James Ward Packard, M.E., '84, provides for a research fellowship in either electrical or mechanical engineering.

The C. Kemble Baldwin Research Fellowships in Aeronautics

A fund established by Mrs. C. Kemble Baldwin as a memorial to her husband, C. Kemble Baldwin, M.E., '95, provides for the appointment of a research fellow in any branch of science having a bearing on the field of aeronautics. One, or occasionally two appointments are available each year.

The Lawrence Calvin Brink Research Fellowship in Civil Engineering

A fund established by the late Mrs. L. C. Brink as a memorial to her husband, Lawrence Calvin Brink, C.E., '94, provides for the occasional appointment of a research fellow in civil engineering.

The Student Chemistry Foundation Fellowship

In the spring of 1927, members of the class of 1930 established the Student Chemistry Foundation in honor of Harry Maas Ullmann, A.B., Ph.D., a member of the chemistry department from 1894 to 1938 and head of the department from 1912 until his retirement. Subsequent classes have contributed to this fund, which now provides an annual research fellowship in chemistry or chemical engineering. Only Lehigh graduates are eligible for this fellowship.

The Garrett Linderman Hoppes Research Fellowship in Civil Engineering

A fund established by the late Mrs. Maria Hoppes in memory of her son, the late Garrett Linderman Hoppes, C.E., '83, provides for the occasional appointment of a research fellow in civil engineering.

The William L. Heim Research Fellowship in Chemistry

A research fellowship in chemistry was established by William L. Heim, B.S. in Chem., '02.

The Roy R. Hornor Research Fellowship in Metallurgy and Inorganic Chemistry

The income from a bequest by Roy R. Horner, B.S., '99, provides for a research fellowship in either metallurgy or inorganic chemistry. While the appointment generally will be made alternately between the metallurgy department and the chemistry department, it may be determined by the qualifications of available candidates.

The Katherine Comstock Thorne Fellowship in Biology

The late Gordon Comstock Thorne of the class of 1916 endowed, in memory of his mother, a fellowship in biology, to be known as the Katherine Comstock Thorne Fellowship.

The John H. Frye, Sr., Fellowship in Metallurgy

A research fellowship in metallurgy was established by John H. Frye, Sr. The research at present is in the field of physical metallurgy.

INDUSTRIAL RESEARCH APPOINTMENTS

Lehigh University cooperates with industrial concerns, technical associations and government agencies in carrying on basic and applied research designed to develop new and improve old products and methods of production. In connection with cooperative research projects, there are usually available every year for qualified graduate students a number of research assistantships. Appointments are for one year, subject to extension or renewal. All industrial research is under the direction of the Lehigh Institute of Research. Applications for appointments as research assistants, accompanied by evidence of the candidate's qualifications for the appointment sought, should be sent to the director of the Lehigh Institute of Research.

Among the cooperative research programs in progress at present are those sponsored by the following agencies:

Various Departments of the United States Government, Army, and Navy
The American Welding Society
The American Electroplaters Society
The American Cyanamid and Chemical Company
The Mutual Chemical Company of America
The Martin Dennis Company
The American Association of Textile Chemists and Colorists
The Prior Chemical Corporation
The Armstrong Cork Company
The Bethlehem Steel Company
The Catalin Corporation of America
The William S. Merrell Company
The Ingersoll-Rand Company
The National Oil Products Company
The National Lead Company
The Westvaco Chlorine Products Corporation
David E. Kennedy, Incorporated
The Seton Leather Company
The S. B. Foot Tanning Company
The Pfister and Vogel Tanning Company
The George D. McLaughlin Memorial Foundation

The Consolidated-Vultee Aircraft Corporation
The Paschall Oxygen Company
The Heilman Boiler Works
The National Printing Ink Research Institute
The American Institute of Steel Construction
The Association of Iron and Steel Engineers
The Socony-Vacuum Oil Company
Merck and Company, Incorporated
The Pressure Vessel Research Committee
The Welding Research Council
The Aluminum Company of America
The Pennsylvania Manufacturing
  Confectioners Association
The Laubenstein Manufacturing Company
Harvey Hubbel, Incorporated

ENDOWMENT OF FELLOWSHIPS

Research fellowships named in honor of an individual or a corporation, offering opportunities for graduate work and training in research in any designated field of study, may be established in perpetuity through the payment to the board of trustees of at least $30,000.00. The terms of the gift establishing a fellowship may provide for half-time service as a research assistant in the Lehigh Institute of Research, the remaining time to be devoted to graduate study. The income from this fund will be paid to the holder of the fellowship, after the deduction of his tuition and such charges as are necessary to cover the cost of materials, supplies, and apparatus required for the work of the fellow.

DEGREES

DEGREES CONFERRED ON MIDYEAR COMMENCEMENT DAY, FEBRUARY 1, 1948

Honorary Degree

DOCTOR OF ENGINEERING

Edward Vernon Rickenbacker
President and General Manager, Eastern Airlines, Incorporated

Degrees in Course

DOCTOR OF PHILOSOPHY

Major in Metallurgical Engineering

Michael Alfred Streicher, B.Ch.E., M.Ch.E., *(Rensselaer Polytechnic Institute, Syracuse University)*

MASTER OF ARTS

Major in Education

Paul Carl Dunkelberger, B.S. *(Pennsylvania State College)*
James Edward Harrington, B.S. *(Lock Haven State Teachers College)*
Paul Franklin Held, Ph.B. *(Muhlenberg College)*
Carl Benedict Laubenstein, B.S. *(Muhlenberg College)*
Richard Irwin Richmond, B.S. *(Muhlenberg College)*

Major in English

Ralph Schultz Graber, B.A. *(Lehigh University)*

Major in History

Eugene Grossman, B.A. *(Muhlenberg College)*
Arthur J. Oplinger, Ph.B. *(Muhlenberg College)*

MASTER OF SCIENCE

Major in Chemical Engineering

Richard Arthur Marriner, B.Ch.E. *(University of Virginia)*
Leonard John McKinley, B.S. in Ch.E. *(Lehigh University)*

Major in Chemistry

Raj Kishore Agarwal, B.S. *(Agra University)*
Willard Stanley Clewell, Jr., B.S. in Chem. *(Lehigh University)*
Jack Clifford Fitch, B.S. in Ch.E. *(Lehigh University)*
Harry Nicholas Hantzes, B.S. in Chem. *(Albright College)*
George Solomon Hartman, B.S. in Ch.E. *(Lehigh University)*
William Leonard Kellner, B.Ch.E. *(Pratt Institute)*

Robert Morris Kirkpatrick, Jr., B.S. in Chem. *(Moravian College)*
Jay Richard Lee, B.S. in Chem. *(Lehigh University)*
William Morgan Perry, B.S. *(University of South Carolina)*
Abb Llewellyn Scarbrough, B.S. in Chem. *(University of Alabama)*
Gerald Clair Snyder, B.S. *(Muhlenberg College)*

Major in Civil Engineering

Ralph Hetrick Himmelberger, B.S. *(Pennsylvania State College)*
Richard Dannecker Horlacher, B.S. in C.E. *(Lehigh University)*
Walter William Luxion, B.S. in C.E. *(Pennsylvania State College)*
Ralph Dominick Palazzo, B.S. in C.E. *(Lehigh University)*

Major in Electrical Engineering

Reuben H. Benner II, B.S. in E.E. *(Lafayette College)*

Major in Geology

Richard Gray Petersen, B.A. *(Lehigh University)*
John Donald Ryan, B.A. *(Lehigh University)*

Major in Industrial Engineering

James Mercer Beauchamp, Jr., B.S. in I.E. *(Lehigh University)*

Major in Mechanical Engineering

Charles Wesley Dodson, B.S. in M.E. *(Duke University)*
William Hall Wetmore, B.S. in M.E. *(Duke University)*
Robert Charles Whitehead, Jr., B.S. in M.E. *(Bucknell University)*

Major in Metallurgical Engineering

Joseph John Buczynski, B.S. in Met.E. *(Lehigh University)*
Robert Kurtz Dunn, B.S. in Met.E. *(New Mexico School of Mines)*
John Hammes Gross, B.S. in Met.E. *(Lehigh University)*

Major in Physics

Donald William Denniston, Jr., A.B. *(Hobart College)*
John Arol Simpson, B.S. in Eng.Phys. *(Lehigh University)*

BACHELOR OF ARTS

Frank John Anderson
Thomas Joseph Carmody
Merton Cohen
Robert Sayre Compton
Richard Murray Francis Davis
Frank Alexander Fatzinger
William Robert Griffith
William Adam Heck
Carl Franklin Henzelman, Jr.
Alan Francis Jones
Leonard Coleman Kline
Robert Paul Lampert
Morgan Lincoln Miller
Neil Logan Ross
Robert Arthur Sawhill
Howard Victor Soltis
Joseph Tropp
William John Wohlhagen

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Arne Elmer Aho
Myer Marvin Alperin
Albert Lundy Baker, Jr.
Robert Eugene Baumgarten
Ira Birnbaum
Clarence Richard Bitting III

William John Burgess, Jr.
James Ray Burke
Robert Edwin Burslem
Robert Alexander Clayton
Alden Curry Cummins, Jr.
Joseph Houston Day
Frank Rodney Dirkes, Jr.
Harry Richard Dunn
Luther William Eisenhart
William Frederick Finney, Jr.
James Henry Flick
Turner Read Fulton
Robert Edward Gilbert
Joseph Malcolm Gladden
Richard Carl Gottschall
William Charles Goulding
Claude Joseph Hafner
Richard Leroy Hagadorn
William Heller
Theodore Robinson Hodges, Jr.
John Rogers Hurlburt, Jr.
Robert Clinton Jackson
John Daniel Keefe
James Henry Kessack
Edwin McMichael
Herman Benjamin Mellott, Jr.
Malachi Joseph Redington
George Michael Resetco
John Patrick Rice
Richard James Rowe
Henry J. Salm
Sherman Grossman Sass
Robert W. Schantz
Arthur James Schwab
Alan Morton Shapiro
Lloyd Orin Shirley
Robert George Shurts
Nicolas Norman Smeloff
Hugh Sheldon Strong
Paul Vernor Thevenet
Boyd Livingston Thistle
Warren Harding Thomas
William Garfield Thomas, Jr.
Robert Harold Thompson
Roger Henry Tove
Theodore Lycurgus Webster
Miles Percival Weidner, Jr.
William Frederick Weigel
Barton David Weisman
Robert Maxwell Wertz
William John Wohlhagen

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Howard Jay Abelow
Charles Hills Bennett
Richard Thomas Billiar
Warren Henry Bradford
Donald Hall Chew
Robert Reber Cockley
Leonard P. Fox
Ralph Strunk Frymoyer, Jr.
Edward George Graybill, Jr.
Pedro Nel Herazo
Raymond Thomas Mohrey
Robert William Schneider
Merrill Mark Smith
Donald Alan Wolf
Carl Kinnaman Zimmerman

BACHELOR OF SCIENCE IN CHEMISTRY

Arthur Clark Hontz
Richard Peter Kassabian

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Morris Berkowitz
Charles Nelson Codding III
Harold Arlington Cunningham
Roger George Dittig, Jr.
Wilmer L. Fisher
Jacob Thorsten Jacobsen
Daniel Lee Jerman
Thomas Roger McCray
Richard Harold Woodring

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

John Tripp Bowley
Nicholas Derewianka
Harry Gerald Harnish
David James Herder
Robert Moody Holdsworth, Jr.
Kuzma Leschak, Jr.
Robert Arthur Phillips
Henry Wallace Rappuhn
William Shelley Richards, B.A. *(Amherst College)*
Jesse Norman Roeder, Jr.
Carl Sanford Teets, Jr.
Albert Oakland Weasner

BACHELOR OF SCIENCE IN ENGINEERING PHYSICS

John Gray Glenn, Jr.
Robert Lincoln Weida

BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING

John Paul Anthony
Harry Edward Arant
Arnold Marvin Cohen
John Daniel Deisler
Howard Malcolm deLaittre
William John Duffy
Walter Jules Hoffberg
Joseph Henry Hopkins, Jr.
Theodore E. Kirch, Jr.
Hugo Otto Kladivko
Maits Dean LeBon
John Robert Lees
Peter Joseph Leyendecker
Theodore Leonard Marantz
Stephen Bowne McElroy, B.S. in Bus. Adm. *(Lehigh University)*
John Stewart Petty
Charles Leroy Pierce, Jr.
Kenneth Newton Pike
Paul George Rajcok
Donald Earl Ross
Forrest Adonis Roth
Lawrence Henry Sharper
Edward Woodruff Shipley
David Dudley Smith
Harold Gordon Smyth
George Russell Stevenson
William Chevallier Waltman
Delmont Eugene Wemple
William Townsend Ziebold

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Richard Warren Bradshaw
David Kaufman Davies
Donald H. Dechant
John Christian Doster
Finn Eriksen
Jefferson Randolph Cary Esser
Patrick Green
Robert Oscar Havekotte
Roscoe Josiah Llewellyn Houser, Jr.
Richard William Jones
Joseph Eugene Koran
Owen William Krause
John McChesney Latimer, Jr.
Gordon Buckley Leyland
Robert Edwin McNabb
John Daniel Morentz
Otto John Nikles
Bruce Wilmot Owen
Richard Paul Quay
Stephen Ratcliffe Rochester
Ernest Clair Rumbaugh
James Sechler Schwartz
David E. Stevens, Jr.
Arthur Stuart Taylor, Jr.

BACHELOR OF SCIENCE IN METALLURGICAL ENGINEERING

Ward Allen Bradford
Norman Henry Halliday, Jr., B.A. *(Lehigh University)*
Daniel Benjamin Kulp
Joseph Harold Mulherin
Samuel Moreau Purdy
Grant Risch
Jay Edwin Schuchar

BACHELOR OF SCIENCE IN MINING ENGINEERING

August Tobias Kaufman, Jr., B.A. *(Susquehanna University)*	Lawrence Edward Mannion
	John Walter Francis Rudnicki

DEGREES CONFERRED ON UNIVERSITY DAY, JUNE 14, 1948

Honorary Degrees

DOCTOR OF SCIENCE

William Lawrence Estes, Jr.
Surgeon-in-Chief, St. Luke's Hospital, Bethlehem, Pennsylvania

DOCTOR OF ENGINEERING

Stewart Joseph Cort
Vice-President, Bethlehem Steel Company

Ovid Wallace Eschbach
Dean, Institute of Technology, Northwestern University

Degrees in Course

DOCTOR OF PHILOSOPHY

Major in Chemical Engineering

Francis Peter O'Connell, B.Ch.E., M.S. *(Villanova College, Lehigh University)*

Major in Chemistry

William Sirius Levine, B.A., M.A. *(Ohio State University)*

Major in Metallurgical Engineering

William Rostoker, B.A.Sc., M.A.Sc. *(University of Toronto)*

CHEMICAL ENGINEER

Charles Stanley Steiner, B.S. in Ch.E. *(Lehigh University)*

CIVIL ENGINEER

Frederick Kingdon Richter, B.S. in I.E. *(Lehigh University)*

INDUSTRIAL ENGINEER

Thomas Timings Holme, B.S. in M.E., M.S. *(Lehigh University)*

MECHANICAL ENGINEER

Donald Herbert Freiday, B.S. in M.E. *(Lehigh University)*

METALLURGICAL ENGINEER

Joseph Knox Stone, Jr., B.S. in Met.E. *(Lehigh University)*

MASTER OF ARTS

Major in Education

Kenneth George Appleton, B.S. *(Ithaca College)*
Elston Joseph Arnt, B.S. in Ed. *(East Stroudsburg State Teachers College)*
Charles Frederick Bachman, Ph.B. *(Muhlenberg College)*
Charles Ernest Brown, B.S. *(Moravian College)*
Frances Marie Ferry, A.B. *(Cedar Crest College)*
Robert Lamar Fisher, B.S. in Ed. *(Kutztown State Teachers College)*
George Edwin Frantz, B.S. in Ed. *(Kutztown State Teachers College)*
Siro Gutierrez-Benliza, B.A. in Ed. *(University of Puerto Rico)*
Harry Stephen Hallman, B.S. in Ed. *(East Stroudsburg State Teachers College)*
Stanley Thomas Heinbach, B.S. in Ed. *(Kutztown State Teachers College)*
Gene Louise Lewis, A.B. *(Cedar Crest College)*
William M. Meck, B.S. in Ed. *(Kutztown State Teachers College)*
Alfred Mark Schappel, A.B. *(Muhlenberg College)*
Walter Hudson Sebring, B.S. in C.E. *(Pennsylvania State College)*
Samuel Walter Snyder, B.S. *(Muhlenberg College)*
Wilford U. Styer, B.S. in Ed. *(West Chester State Teachers College)*
Lloyd Charles Trexler, B.S. in Ed. *(Kutztown State Teachers College)*
Clarence Edward Wert, B.S. in Ed., Th.B. *(Kutztown State Teachers College, Allentown Bible Institute)*
John Charles Young, Ph.B. *(Muhlenberg College)*
Clarence Ray Ziegler, B.S. in Ed. *(Muhlenberg College)*

Major in English

Patterson Dix Benner, B.A. *(Miami University)*
Franklin Edmund Kenyon, B.Ed. *(New York State Teachers College)*
Ellis Alvin Newton, A.B. *(Western Maryland College)*

Major in History

Dorothy Constance Bolmer, B.A. *(New Jersey College for Women)*
Olympia Kathryn Cassone, A.B. *(Cedar Crest College)*
Charles Gilbert Hafner, B.A. *(Lehigh University)*
Paul Addison Hamlin, B.Ed. *(Brockport State Teachers College)*
George Edward Herbert, B.A., B.D. *(Ursinus College, Theological Seminary of the Reformed Church)*
Richard Levitt, B.A. *(Ashland College)*
Richard Northrup Roloff, B.Ed. *(Brockport State Teachers College)*

Major in Psychology

Walter Lesesne Anders, Jr., B.A. *(Lehigh University)*
Jacob Lester Barber, Jr., Sc.B. *(Dickinson College)*
Martin Hill Getz, B.A. *(Moravian College)*
William Frank Reiterman, B.A. *(Lehigh University)*

Major in Spanish

Margaret Alice Barrett Rudd, A.B. *(Eton College)*

MASTER OF SCIENCE

Major in Bacteriology

John Andrew Growich, Jr., B.S. *(Muhlenberg College)*
John William Sanders, B.A. *(Lehigh University)*
Dorothy Lamb Wilmer, B.S. *(Moravian College for Women)*

Major in Biology

Joseph Raymond Cicchino, A.B. *(Montclair State Teachers College)*

Major in Chemical Engineering

Louis Maus, Jr., B.S. in Ch.E. *(Lehigh University)*
William Thomas Straehle, B.S. in Ch.E. *(Lehigh University)*
Robert Lansing Tilton, B.S. in Ch.E. *(Lehigh University)*

Major in Chemistry

Polly Alice Burkhead, B.A. *(Carleton College)*
Paul Alex Krentel, B.S. *(Michigan State College)*
Sanjoy Sen, B.Sc. *(Calcutta University)*

Major in Civil Engineering

Paul Harry Kaar, B.S. in C.E. *(University of Illinois)*
Edgar Kirton Muhlhausen, B.S. in C.E. *(Lehigh University)*
Toshiaki Shintaku, B.S. in C.E. *(Lehigh University)*

Major in Electrical Engineering

Frank Ralston Roberts, B.S. in E.E. *(Lehigh University)*
Erh-Hsin Wang, B.S. *(National Central University)*

Major in Geology

Louis Field Dellwig, B.A. *(Lehigh University)*
Walter Swart Skinner, B.S. *(Monmouth College)*

Major in Industrial Engineering

Robert Stevens Buxton, B.S. in M.E. *(Massachusetts Institute of Technology)*
Donald Groves Magill, Jr., B.E. in Ch.E. *(Yale University)*
Stanley Grove Timmerman, Jr., B.S. in M.E. *(Massachusetts Institute of Technology)*

Major in Mechanical Engineering

Howard Viele George, B.S. in M.E. *(Lehigh University)*
Victor Eugene Kohman, B.S. in M.E. *(Worcester Polytechnic Institute)*
Ludwig Robert Kowalski, B.S. in M.E. *(Duke University)*
William Ellsworth Reaser, B.S. in M.E., M.E. *(Lafayette College)*
Kenneth Gilbert Swayne, B.S. in M.E. *(Lehigh University)*

Major in Metallurgical Engineering

Charles Franklin Bild, B.S. in M.E. *(University of Virginia)*

Major in Physics

Nathaniel Ellmaker Hager, Jr., B.S. *(Franklin and Marshall College)*

BACHELOR OF ARTS

John Cornelius Beers
William Turnbull Bradner
Joseph John Clements
Nathan Cohen
Alden Daratt Conger, Jr.
Mitchell Walter Connor
John Darby Cullen
David Francis Davidson
Richard Charles Davis
James Morris Dennison
Bruno DePaoli, Jr.
William Livingston D'Olier, Jr.
Robert Pool Ferguson
George Henry Fraunfelter
Joseph Francis Fruhwirth, Jr.
Paul Steven Glaser
Norman Alan Haft
Blackburn Huger Hazlehurst
George Frederic Helm, Jr.
George Washington Henry III
William Matthew Henry
John Douglas Ingram
Merritt Wayne Jacoby
Henry Clarence Judd
Quentin Charles Jurgensen
Emil William Klimack
Albert Anton Koehler, Jr.
Bernard Kurtin
Robert Charles Lynn
Richard Griffith Malsberger
Lester Graham Matthews, Jr.
William Joseph Matysek
Charles Roebling Meissner, Jr.
Robert Edwin Mertz
H. Bruce Mininberg
Dean LaRoche Moyer
John Trull Palmer
Clarence Illingworth Pearsall
Robert Polstein
Frederick Lee Richards
Charles Allen Roth
John James Ryan, Jr.
Frederick Carl Salber, Jr.
Robert Ferris Saydah
Morton Kanter Schwartz
Ralph Grayson Schwarz
William Wolfgang Schwendinger
Irwin Scollar
Sylvain Segal, Jr.
Joseph Patrick Sheehan
John Francis Spirk
Joseph Robert Livingston Sterne
David James Elwood Sweet
Francis Cleland Tatem, Jr.
Edward Sawyer Tattershall
Frederick Lincoln Villa
William Higham Walker
Marvin Seymour Weinreb
Frederick Willoughby Weston, Jr.
Warren Wiegand
John Joseph Windish, Jr.
Ralph Hartman Woelfel, Jr.
Dikran Yazujian

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Charles Craig Allen
Conway Montgomery Andersen
John Michael Archibald
Walter Hamilton Ayers
Gilbert Spruance Ball
William George Bourne III
David James Burre
Warren William Chedd
Herbert William Christ, Jr.
Burton Nelson Coffman
Henry Victor Condit
Alfred Wilson Darlow
Elwood Charles Davis
Richard William Davis
Asa Lopez Day, Jr.
Edward Leon Deal
Arthur William Defenderfer, Jr.
James Edward Donegan
Alvin Gans Farans
Parker Fredericks, Jr.
Guenther Hilmer Froebel, Jr.
August George Fromuth
James Wallace Gentles, Jr.
Cornelius S. Glock, Jr.
Murray Henry Goodman
Robert Charles Haines
Harvey Granville Hallenbeck, Jr.
Norman Allen Howard

George Andrew Hrivnak
Frank Robert Huth
Norman Johansen
Robert Edgar Katz
C. Merris Keen, Jr.
Lawrence Kelechava
Walter Edwin Kemmerer
Herbert Parkman Kendall, Jr.
Carl August Kendziora, Jr.
Harry John Klingler, Jr.
James William Knowles
David Conrad Koenitzer
Harold William Korshin
Melvin Allan Lazarus
Robert Durling Lobell
Freeman Park MacKay, Jr.
Edward Scudder Mackey, Jr.
Raymond Clarence Madison
Edward A. Malone, Jr.
Bernard J. Marcus
Frank Aloysius Martin III
Robert Burton McCleery
Elmer Elton McClow
Charles Henry Messerve
Edgar Hanmer Miller
Bernard James Mulhern
William Albert Nelson
James Arthur Orr
Miles Hallacker Orth, Jr.
Harry Kenneth Pearson
Joseph Richard Persa
Robert Turner Pierce
Eric Protter
Harry William Redding
John Lawrey Richards II
Robert Morrison Rick
Harold Budd Robeson, Jr.
David White Rogers
Warren Lee Ruff
Frederick William Ruoff
James Michael Taylor Scanlan
William Schwanda
Harry Simpson
Richard Allen Staley
Lawrence Wilbur Stanley
Allen Robert Sterner
Richard Ramsey Stevick
Bennett A. Strober
Donald Warren Swift
Howard Eltinge Taylor, Jr.
Edwin Raymond Theis, Jr.
Harry Topliss, Jr.
James Luke Troy
Maurice Shiffert Tyson
Elmer Joseph Valansky
Dominick Michael Vallario
Donald vanRoden
Rudy Louis Vincenti
Edwin Barton Wachtel
Richard Byron Walters
Bryn William Waters
John William Wearne
Howard Richard Weinstein
Robert Joseph Weiss
Glenn Huet Williams
James Wesley Winchester
Robert Renwick Wylie
William Donald Ziesel

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Edward Artim
Curtis Leroy Baskin, Jr.
Maurice Bick
L. John Biegler, Jr.
Jules Henry Bluestone
John Andrew Clark, Jr.
Hugh Aloysius Conahan, Jr.
Henry Epstein
John Douglas Evans
Donald Hesse Fiedler
Richard Lindbergh Frankenfield
Glenn Erwin Handwerk
John Francis Hannan
David Southerland Hollingsworth
Andrew James Hutchinson, Jr.
Russell Richard Jones
Harry Klapper, Jr.
Walter Kluck
Frederick William Kocher, Jr.
Franklin Joseph Lauten
Donald Owen Maxwell
Robert William Mountsier
Charles Bernard Palmer
Seemon H. Pines
John Frederick Powell
William Frederick Reehl

Alfred Lincoln Rosener, Jr.
Robert Benjamin Rosener
David Emanuel Simon II
Robert William Steinmetz
Donald Frank Stoneback
John Allen Tallmadge, Jr.
Rodman Baily Teeple, Jr.
James Henry Trask
Fletcher Stulen Vondersmith
Ebon P. Weaver
Ralph Emerson Werley, Jr.
Henry Kline Wetherhold
Sanford Wright Wilson, Jr.
Wallace Vladimir Zacharchuck
Herman Cornelius Zwart

BACHELOR OF SCIENCE IN CHEMISTRY

Mark Martin Jones
Aldo Joseph John Pin
Philip Key Reily, Jr.
Walter Gerald Sall
Robert Parker Suman
Charles Richard Whitehead

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Robert Stevens Bassett
Robert Francis Bitler
Pao-Yao Chou
Carl Creidenberg
Richard Snyder DeTurk
George Walter Harris
Edward France Heller
Stuart Robert Helthall
James Weldon Hooper
Walter Searle Hulse, Jr.
Daniel Bogdan Karpowich
Albert Chamberlin Kuentz
Theodore Kelsey Lamberton
Duncan Woolford Macdonald
William Douglas McLean
Joseph Harold Mixner
Harold DeBlois Rice, Jr.
Robert R. Roths
William Alfred Salmond
Ronald Arthur Schillat
Samuel Kendall Stellfox
Carl Wayne Strayer
Frank Gerald Vargo, Jr.

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Frederick Gulick Adams
Boris Baiko
Walter Bernard Ballenberger
Bertram Joseph Blewitt
Harry Austin Bonser, Jr.
Thomas Archer Bottomley, Jr.
Coleman Tileston Clark II
Edmund vanStralen Claxton
Walter Marsby Creitz, Jr.
Richard Frank Cressman
Robert Stanford Dart
Charles Lehman Downs, Jr.
Stanley Edward Eisenhard, Jr.
Howard Irwin Ellowitz
Alexander Hamilton Fay
Albert Rudolph Granese
Richard Weaver Gretz
Charles Peter Herold
Robert Carl Herzfeld
Charles Richard Hills
Eugene Francis Holben
Charles Haubert Horn
Winslow Leroy Hurford
George Whitesell Kahler, Jr
Robert John Karlik
Edward Otto Kassman
Claude Clymer Kleckner
Ivan Hansell Landes
George Burnett Lewis
Frank Roger Licini
Neil Angus MacInnes
Edmond Joseph McClure, Jr.
Richard Beryl Mesirov
Kenneth Lee Moses
Leon Linton Nonemaker
James Lee Owings
James David Price
Robert Clark Renick
George Dorwart Rockefeller, Jr.
George Ralph Rosenberger

Joseph Lewis Ross
Stanley Schmerken
Robert Eugene Sentz
Jared Scott Smith
Eugene Harry Sowers
Mark Alan Steinhacker
Alvin Elliott Stetson
Michael Toth, Jr.
Jack Harrison Venner
Robert Daniel Wallick
James Landis Weaver
Charles J. Weidknecht
Paul David Wellenkamp
John Vernon Werme
Selwyn Thomas Williams

BACHELOR OF SCIENCE IN ENGINEERING PHYSICS

Joel Mitchell Alperin
Eugene Walther Baer III
David Hunden Evans
Aaron L. Kestenbaum
Rudolph Leonard Kuehn
Robert William Parkinson
William Babcock Poland, Jr.
Donald Frey Ressler
Theodore Albert Shook

BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING

David Williston Armstrong
Kenneth Francis Bender
Charles William Boig
Ralph Burton Bordner
Edmund Warren Bowden, Jr.
Irving Francis Bugg
Robert Strohmeier Cliff
John Samuel Connor
John James Conway, Jr.
Samuel Wilbur Croll, Jr.
Edward Knapp Cumming, Jr.
Michael Alfred Decicco
Bruno DePaoli, Jr.
Frank William Dickel
Donald Edward Draper
William Lewis Eakin
Robert Gilbert Ecob
Richard Hoyt Forshay
Richard Charles Hopkins
Richard Herckman Jones
Bernard Kane
Edwin Leslie Leet
Charles Benjamin Lindner
Leonard Jacob Luckenbach, Jr.
John Harper MacMillan
Richard Mascuch
Benoit Laddie McMahen
Burton David Michel
Harold Sheaffer Mohler
William Nelson Packard, Jr.
Leven Irving Pollitt III
Laile Wallace Potter
John Joseph Probst
John Granville Redline, Jr.
Christian George Roth
Robert Edward Schmaltz
Merritt Curtis Schmoyer
Arnold David Schwartzberg
Richard Miller Smith
Edwin Henry Snyder, Jr.
George Bruce Staples, Jr.
Robert Kenneth Stolz, Jr.
Charles Johnson Stone
Donald Winchester Tarbell
Robert Briah Thurstin
Edward John Toggart
Edward Rice Torongo
Anthony Valentine Ursic, S.B.
(Harvard University)
Harry Beames Walton, Jr.
Herbert Spencer Ward
Richard Clarence Weiler
Charles McCartney Wellons
Robert LeRoy Yeager
Charles Lewis Young

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Robert George Balla
Warren Eugene Best
Herbert Kurt Beyer
William Rodger Biser

Richard Phillips Bodine
Carl Raymond Brandt
Edwin Charles Brown, Jr.
Ping Chen
Camden Garlow Conaway, Jr.
Donald William Cooper
Charles Cusworth
Richard Thomas Davies
Harold Vanlear Fatzinger
Thomas Richard Fay
George Allen File
Joseph Mario Gatelli
Peter Simmonds Given
Eugene Harry Gloss
Richard Alvin Gray
Charles Foley Stewart Grubmeyer
Drew Wright Hageman
William Edson Hardy
Thomas L. Hartman, Jr.
Eugene William High
August Joseph Hildenbrandt, Jr.
Ralph Everett Hohman
Gordon Mac Johnson
Thomas Henry Johnston
John Howard Keenan
Alfred Arthur Lomar
Robert Jewell Loomis
John Augustus Mather II
Albert Pryibil McCauley, Jr.
Floyd Nelson Moschini
David Maxwell Parke
Eugene Pozebanchuk
George Watson Randall
Edwin Henry Richards, Jr.
Robert Remick Risher, Jr.
Daniel Tressler Sachse
Richard Earl Schaffer
Robert Ellsworth Schmidt
Joseph Byrd Shearer
Willard Leroy Sloggett
Ethan Allen Smith, Jr.
Louis Carlyle Smith, Jr.
Robert Lamphiere Smith
Cole Stratton
Jesse Robert Tyson
George Marshall Walker
Bruce William Waltz
George Lindsay Weigle
James Russell Welding, Jr.
Walter Robert West
Biddle Arthurs Whigham
John Zickel

BACHELOR OF SCIENCE IN METALLURGICAL ENGINEERING

Carson Behler Bartholomew
Richard Henry Buckwalter
Leon Conrad Holt, Jr.
Ralph Wayne Kraft, Jr.
Bernard Werner Levinger
Harold Robert Lyons
Peter Charles Rossin, Jr.
Edward Wesley Stotz
Loyal Albert Stoyell II, B.S.
(Niagara University)
Ching-Lin Tang
James Thomas
Howard Earle Tomlinson, Jr.
Charles Harry Tuttle

BACHELOR OF SCIENCE IN MINING ENGINEERING

Lloyd Earl Antonides
Frank Aloysius Burns

COMMISSIONS AS SECOND LIEUTENANTS IN THE OFFICERS' RESERVE CORPS

Members of the Graduating Class

Infantry

William Donald Ziesel

Ordnance

*Walter Marsby Creitz, Jr.
William Douglas McLean
Floyd Nelson Moschini
Robert William Parkinson
*Philip Key Reily, Jr .
Robert Remick Risher, Jr.
George Dorwart Rockefeller, Jr.
Robert William Steinmetz

John Allen Tallmadge, Jr.
Rodman Baily Teeple, Jr.
Charles Lewis Young

Air Force

Robert George Balla
*Asa Lopez Day
*Edward A. Malone, Jr.
Robert Edwin Mertz
John Trull Palmer
*Joseph Richard Persa
Robert Ferris Saydah
Carl Wayne Strayer
David James Elwood Sweet

Undergraduates

Infantry

Robert Lynn Bewley
Daniel Eugene Denham, Jr.
Dean Brackett Ellison
Edwin Paul Ernst
*Francis Xavier Gabriel
Jay Hughes Goodhart
Robert Mack Harter
*Paul John Jani, Jr.
Edmund Leonard Kaminsky
Calvert Gentry Knight
Richard Sheely Miller
Walter Benson Morton, Jr .
James Arthur Noel
Paul Edward Schwab
*Harold Taylor
Emerson Hart Virden, Jr.

Ordnance

*Stanley Casimir Antas
John Shepard Beard
John Reber, Jr.
John William Rowley

Air Force

Wolfram Arthur Abicht
John Francis Ahern
Thomas Michael Barnicle
Nelson Robert Behler
Arthur Bruce Borgeson
John Harry Boyer
Edward Eugene Clarke
Julius Richard Gosztonyi
Frank Allen Hartshorne
Robert Crouse Huber
Robert Nissley Kendig
Charles Jerome Lentz
Byron Barney Lympany
Joseph Rudolph Mihalek
Joseph James Phillips
Herbert Burgess Pilling
Stephen Pociluyko
Frank Eric Pschorr
Clifford Thomas Raidline
John Hendrickson Rumbarger
Douglas Michel Sammak
Samuel Franklin Snyder, Jr.
Charles Elmer Stiles, Jr.
*Robert Henry Swayne

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*Upon completion of Summer Camp.

DEGREES CONFERRED ON FOUNDER'S DAY
OCTOBER 10, 1948

Honorary Degree

DOCTOR OF LAWS

Sumner Huber Schlichter
Lamont University Professor, Harvard University

Degrees in Course

DOCTOR OF PHILOSOPHY

Major in Chemistry

Ralph Wagner Bentz, B.S., M.S. *(Albright College, Lehigh University)*
Isaac Moyer Hunsberger, B.S. in Chem., M.S. *(Lehigh University)*
James David Justice, A.B., M.S. *(Harvard College, Brooklyn Polytechnic Institute)*

Major in Metallurgical Engineering

Cyril John Osborn, B.Met.E. *(Melbourne University)*

MASTER OF ARTS

Major in Education

William George Bartholomew, B.S. in Ed. *(Kutztown State Teachers College)*
Gordon Stanley Feller, A.B. *(Muhlenberg College)*
James Max Fenstermacher, B.S. *(Muhlenberg College)*
William Pollard Griffin, Jr., Ph.B. *(Muhlenberg College)*
Ralph Richard Johnson, B.A. *(Lehigh University)*
Carl Joseph Manone, B.A. *(Lehigh University)*
Mary Jane Morris, B.A. *(Pennsylvania State College)*
Otis Jacob Rothenberger, B.S. in Ed. *(Kutztown State Teachers College)*
Russell Franklin Schleicher, B.S. *(Pennsylvania State College)*
Herman Peter Snyder, B.S. *(Muhlenberg College)*
Augustine Carl Weinhofer, A.B. *(Muhlenberg College)*

Major in English

Pauline Vivian Getz, B.S. in Ed. *(Muhlenberg College)*
Edwin Albert Sawyer, B.S. in Bus. Adm., B.D. *(Lehigh University, Moravian Theological Seminary)*

Major in History

Florence Esther Mock, A.B. *(Muhlenberg College)*
Nathan George Wagner, B.S. in Ed. *(West Chester State Teachers College)*
Donald Atlee Workman, A.B. *(Muhlenberg College)*

Major in Mathematics

Robert Harry Spohn, A.B. *(Lebanon Valley College)*
Ralph Waldo Young, A.B., M.S. *(Ball State Teachers College, Indiana University)*

MASTER OF SCIENCE

Major in Chemical Engineering

Hsi Hsu, B.S. *(The National University of Chekiang)*

Major in Chemistry

Nayudamma Yelevarthy, B.Sc. *(Benares Hindu University)*

Major in Industrial Engineering

Edward Ludlam Blossom, B.S. in E.E. *(Lehigh University)*

Major in Mechanical Engineering

Donald Bond Pennington, B.S. in M.E. *(Duke University)*
Roger Rawson, B.S. in M.E. *(Clemson College)*
George Clinton Shay, M.E. *(Stevens Institute of Technology)*

Major in Metallurgical Engineering

Daniel David Pollock, B.S. in Ed. *(Temple University)*

Major in Physics

John William Marini, B.S. in Eng. Phys. *(Lehigh University)*

BACHELOR OF ARTS

Frank Brenner
John James Gilligan Enright
George Harold Leach
Thomas Carleton Lee III
Thomas Edward Lewis
Edward Peter Nork
George Llewellyn Richards
Stuart Emanuel Stern

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Paul James Alexy
Stiles Robert Baldwin
James Warren Bausman
Richard Moss Bowes
Richard James Boyle
Douglas Young Campbell
James Matthews Christie
Robert Muir Coeyman
Clyde Sayre Ely
John Steven Fabian
Alfred Charles Farrell
Stanley Feinberg
Martin Dolins Fife
Daniel Joseph Green
John Hegedus
Stanley Taylor Holmes, Jr.
John William Hurley
Clarence John Jewell, Jr.
Howard Alfred Kucher
Earl Jay Lambert
William Morris Landau
Curtis Weston Magee
Wallace Roy Mayer
Henry Lockwood McGrath, Jr.
Neal Sam Moreton
David Henry Morris
James Patrick O'Connor, Jr.
Herbert Burgess Pilling
Robert King Powell
Benjamin William Powers
Herbert William Quint
Thomas Ellis Rivers, Jr.
Pasquale Frederick Ronca
Marvin Evan Rosen
John William Sansone
Arnold Herbert Schwartz
Robert Wray Sexton
Benjamin Maurice Shaner
Robert Orton Shealor
Richard DeWitt Spradling
Charles Elmer Stiles, Jr.
Norman Harry VanLeuven
John Lawrence Walker
Raymond Thomas Walter, Jr.

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Rowland Barton Miles
Robert Allen Nichols

BACHELOR OF SCIENCE IN CHEMISTRY

Wilmer Carl Eisenhard
Richard Alfred Wirth

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

George Ludwig Betz
Robert Clayton Buckwalter
Herbert Ellery Fletcher II
Vincent Joseph Hilaire
Irvin Lefever Huber
Frank William Moyer
Joseph Raymond Stan

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Peter August Fetterolf
Frank Allen Hartshorne
Mark Robert Hontz
James Edward Markle
Alexander Huyette McKean, Jr.
Lewis Irwin Mengle

BACHELOR OF SCIENCE IN ENGINEERING PHYSICS

Robert Thomas Dunn
Stephen Kucsan
William Tracy Southworth
Joseph Spontak

BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING

Vere James Banks, Jr.
Charles Milton Conover
James Ernest Duff
Robert Spencer Everly
Robert Pool Ferguson
Robert Bernard Gaver
J. Richard Gostonyi
Frederick Robert Lentz
Maurice Theodore Martin
John William Rowley
Robert Bates Winkel
John Aaron Youtz

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Daniel Edward Bigelow
Norman Bennett Christie
Robert Francis Duffy
William Michael Kavalkovich
Arthur Jacob Koch, Jr.
Ross Clement Lovington
George Lawrence Martin, Jr.
Frederick Walter Merwin
Walter Paroby
Enoch Perkins, Jr.
Robert Raymond Ream
John Jacob Roche
Harold John Schupsky
Frank Ward Shirey
Jackson Seidel Snyder
Samuel Franklin Snyder, Jr.
Robert James Stevens
John Harold Wagner, Jr.
George Herbert Wright

BACHELOR OF SCIENCE IN METALLURGICAL ENGINEERING

Russell Charles Nelson
Robert Thaddeus Rospond
Michael Demetrios Savopoulos

HONORS

HONORS ANNOUNCED ON MIDYEAR COMMENCEMENT DAY, FEBRUARY 1, 1948

Graduation Honors

GRADUATED WITH HIGHEST HONORS

Ernest Clair Rumbaugh
Sherman Grossman Sass

GRADUATED WITH HIGH HONORS

Edwin McMichael
Morgan Lincoln Miller
Robert Arthur Phillips
Alan Morton Shapiro
William Frederick Weigel

GRADUATED WITH HONORS

Myer Marvin Alperin
Charles Nelson Codding III
Alden Curry Cummins
John Daniel Deisler
Frank Rodney Dirkes, Jr.
Roger George Dittig, Jr.
Jefferson Randolph Cary Esser
John Gray Glenn, Jr.
Norman Henry Halliday, Jr.
David James Herder
Richard William Jones
Robert Paul Lampert
John McChesney Latimer
Lawrence Edward Mannion
Robert Edwin McNabb
Herman Benjamin Mellott, Jr.
John Daniel Morentz
Richard Paul Quay
John Walter Francis Rudnicki
Harold Gordon Smyth
Carl Sanford Teets, Jr.
Boyd Livingston Thistle
Carl Kinnaman Zimmermann

HONORS ANNOUNCED ON UNIVERSITY DAY, JUNE 14, 1948

Graduation Honors

GRADUATED WITH HIGHEST HONORS

Walter Hamilton Ayers
Nathan Cohen
Walter Marsby Creitz, Jr.
Samuel Wilbur Croll, Jr.
Harvey Granville Hallenbeck, Jr.
Winslow Leroy Hurford
Robert Edwin Mertz
Leon Linton Nonemaker
Ethan Allen Smith, Jr.

GRADUATED WITH HIGH HONORS

Richard Phillips Bodine
Elwood Charles Davis
Stanley Edward Eisenhard, Jr.
David Hunden Evans
John Francis Hannan
Quentin Charles Jurgensen
Frederick William Kocher, Jr.
Bernard Kurtin
Frank Roger Licini
William Douglas McLean

Robert William Parkinson
Seemon H. Pines
Robert Polstein
Alfred Lincoln Rosener, Jr.
Robert Benjamin Rosener
Warren Lee Ruff
Eugene Harry Sowers
Allen Robert Sterner
Carl Wayne Strayer
Robert Daniel Wallick
Harry Beames Walton, Jr.
John Zickel

GRADUATED WITH HONORS

Conway Montgomery Andersen
Edward Artim
Gilbert Spruance Ball
John Cornelius Beers
Maurice Bick
Carl Raymond Brandt
Frank Aloysius Burns
Joseph John Clements
Burton Nelson Coffman
Hugh Aloysius Conahan, Jr.
Mitchell Walter Connor
John James Conway, Jr.
Richard Charles Davis
Arthur William Defenderfer, Jr.
Richard Snyder DeTurk
James Edward Donegan
Howard Irwin Ellowitz
John Douglas Evans
Thomas Richard Fay
Donald Hesse Fiedler
George Allen File
Joseph Francis Fruhwirth, Jr.
Glenn Erwin Handwerk
George Washington Henry III
Leon Conrad Holt, Jr.
Norman Allen Howard
Mark Martin Jones
Richard Herckman Jones
Aaron L. Kestenbaum
Emil William Klimack
Ralph Wayne Kraft, Jr.
Ivan Hansell Landes
Melvin Allan Lazarus
Bernard Werner Levinger
Alfred Arthur Lomar
Robert Jewell Loomis
Lester Graham Matthews, Jr.
William Joseph Matysek
Elmer Elton McClow
Edgar Hanmer Miller
James Lee Owings
David Maxwell Parke
Aldo Joseph John Pin
Joseph Lewis Ross
Frederick Carl Salber, Jr.
Walter Gerald Sall
Richard Earl Schaffer
Stanley Schmerken
William Schwanda
Morton Kanter Schwartz
Sylvain Segal, Jr.
Jared Scott Smith
Louis Carlyle Smith, Jr.
Richard Miller Smith
Robert Lamphiere Smith
Edwin Henry Snyder, Jr.
Richard Allen Staley
Samuel Kendall Stellfox
Joseph Robert Livingston Sterne
Robert Kenneth Stolz, Jr.
Loyal Albert Stoyell II
John Allen Tallmadge, Jr.
Rodman Baily Teeple, Jr.
James Henry Trask
George Marshall Walker
Herbert Spencer Ward
James Landis Weaver
Marvin Seymour Weinreb

HONOR GRADUATES IN THE RESERVE OFFICERS' TRAINING CORPS

Infantry

William Donald Ziesel

Ordnance

William Douglas McLean
Robert William Parkinson
Robert Remick Risher, Jr.
John Allen Tallmadge, Jr.
Rodman Baily Teeple, Jr.

Air Force

Edward A. Malone, Jr.
Robert Edwin Mertz
John Trull Palmer
Carl Wayne Strayer

HONORS ANNOUNCED ON FOUNDER'S DAY, OCTOBER 10, 1948

Graduation Honors

GRADUATED WITH HIGHEST HONORS

Mark Robert Hontz
Howard Alfred Kucher
Herbert William Quint

GRADUATED WITH HIGH HONORS

Daniel Edward Bigelow
John James Gilligan Enright
Earl Jay Lambert
Thomas Carleton Lee III
Rowland Barton Miles

GRADUATED WITH HONORS

Paul James Alexy
George Ludwig Betz
Frank Brenner
John William Hurley
James Edward Markle
David Henry Morris
Frank William Moyer
John Jacob Roche
Richard Alfred Wirth

Class Honors

(Awarded to those members of the freshman and sophomore classes who made an average grade of 3.00 or higher)

FRESHMAN HONORS

Robert Henry Albrecht
Richard Marshall Allen
Harry Jack Baker
Charles Adolph Barth, Jr.
Raymond Basiago
Louis Wells Bevier
Albert Franklin Biddleman
James Irvin Bowman
Richard Boyd
Howard Allen Boyer
George David Braik
William David Breingan
Kenneth Joseph Busch
Elliot Ward Cheney, Jr.
Newton Bing Chin
Harold Edward Conway
William Williams Crehore III
Frank Michael Cummins
William Schaff Davis III
Charles Burton Day
David Errickson Dickey
Robert Edward Drake
Charles Michael Dugan
William Glenn Dutton
Arthur Charles Dwyer
Otto Ehrsam, Jr.
Alfred Thompson Ela
Richard McElvain Elrick II

Richard Walter Fehnel
John Joseph Freeh
William Charles Freyman
Charles Theodore Fryberger II
Thomas George Gabuzda
John Joseph Galvin
William Starling Garrett, Jr.
Henry Stillman Gates
Andrew Gillan Gibson
Mark Edwin Ginder
Robert Gozzard
Dallas Schultz Graber
Conrad Raymond Graeber, Jr.
Peter Wallace Greason
Herbert Frank Gretz, Jr.
Edwin Harold Hallberg
Robert Munroe Hannan
Norman Andrew Hontz
Herbert Christopher Hoover, Jr.
Herbert Leslie Hoover
Richard Webb Irwin, Jr.
Robert Joseph Jacobs
Dickinson Roberts Kearney
Thomas Herbert Keel
James Neilson Kennedy, Jr.
Robert George Laible
George Donald Long
David Cass Lyman
John Thomas Lyons
John Joseph MacDonald
Francis McVeigh Manley
Eric Charles Martin
John Henry Miller
Frank Allen Mink, Jr.
Robert Edward Mitchell
Jesse Monroe Monsell, Jr.
Stanley Raymond Moore
John Walter Moorehouse, Jr.
William Murray Morley
Richard William Moscotti
George Carl Moyant
Joseph Bradley Moyer
John Einar Offerdahl
William Harry Olischar
Ervin Carl Palasky
Albert Peter Paragone
Harold Edward Paulus
Edward Michael Pawlak
John Christian Pfleuger
Emmett Williamson Poindexter, Jr.
Edward Macrae Pope
Rodrigo Alvaro Restrepo
Andrew Donaldson Robb III
Robert Allen Sailor
Forrest Grim Schaeffer
Donald Paul Schlegel
John Walter Scott
Richard Eugene Stauffer
Gustave Richard Stefanik
Edward Thomas Stephenson
John Henry Stoll, Jr.
Robert Norman Taylor, Jr.
Jack Simon Vanderryn
John Hasbrouck VanNess
Charles Franklin Voros
William Stuart Weinberg
Samuel Barton Wilkinson
Eugene Griffin Williams
Lloyd Armstrong Wittenberg
Michael Edward Yannone

SOPHOMORE HONORS

James Latimer Abbot
John Francis Ahern
Alfred Hetherington Aitken
Charles Wesley Allen III
Frank Olaus Anderson II
Richard Asher Ash
John Jacob Avey, Jr.
Rex McClain Baker, Jr.
Ray Roger Bast
Alvord Miner Beardslee
Roger Ferdinand Bergum
John Henry Bond, Jr.
David Lentz Boyer
Edward Baxter Boyle, Jr.
Bruce Burton Burnett
Lee Crittendon Carpenter
John Millar Carroll
Charles Mollison Close
Robert William Courtney
Albert Bowman Cristy
Rodger Lee Daniels
David Donald Degler

Robert John Drack
Arthur Frederick DuBois
George Emery Erdman
David Joshua Ettelman
Frank Charles Fichter
Harold Marvin Foster
Newton Frishberg
James Shirley Fulleylove
Ralph Adam Greenawald
James Butzer Gudikunst
John Hacik, Jr.
Joseph Rudolph Haftl
William George Hartzell
Lee Raymond Hauser
Merit Richard Henry
Edward David Hinkel, Jr.
Robert Tyler Hucks, Jr.
Rheiner Thomas Hutchins III
Allan Brasier Judson
George Charles Kaiser
Robert Fred Kamp
Edgar Alfred Kerrick
Julius Stephen Kovacs
Alfred Joseph Land
Frederick Charles Langenberg
Paul Albert Lentz
Edward Bernard Levine
Anton Joseph Lisicky
Laurence Arnold Martin
Keith Wickham Mattison
Harold R. Meck, Jr.
Donald Floyd Miller
Karl Gritz Miller
Edward George Mittal
John Moskowitz
Lawrence Edward Mulock
Robert Stanton Nichols
Richard Jason Orford
Fred Panasiuk, Jr.
Robert Elmer Perry
Andrew Rakachy
Jackson Arthur Ransohoff
Freedel Alfred Rauch
Luther Reber
Philip Gehr Ridinger
Francis Stevenson Riley
Albert Deitz Rittman
Carlyle Jones Roberts, Jr.
John Rohall, Jr.
Richard Raymond Rohrbach
William Paul Samuels
Herbert Kenneth Schnall
Frank Anthony Schneiders, Jr.
Grover Jacob Schrayer
Anthony Wayne Schwab
Theodore George Schwarz
Vito Anthony Scriptunas
Frederick Paul Sell
Alexander Forbes Smith III
James Andrew Smith
Robert Vincent Smith, Jr.
Wesley Richard Smith
Richard William Spalding
Grant Edward Spangler
Richard Rhode Storrow
Bruce Yale Tapper
George Robert Vogt
Edwin Andrew Wallace
John William Way
Frank Edward West
John Michael Weston
Thomas Gerard White
Robert Edward Wieder
Duncan MacKenzie Wood, Jr.
Michael Andrew Yatsko
Alan Edward Yost, Jr.

PRIZES

PRIZES ANNOUNCED ON UNIVERSITY DAY, JUNE 14, 1948

Alumni Senior Prize, $25—to the highest ranking senior in businesss administration. Divided between:

Walter Hamilton Ayers
Harvey Granville Hallenbeck, Jr.

American Institute of Electrical Engineers Student Membership Prize—for outstanding service to the Student Branch of the American Institute of Electrical Engineers

Winslow Leroy Hurford

American Society of Civil Engineers Junior Membership Prize—to the highest ranking senior in Civil Engineering holding membership in the Student Chapter of the American Society of Civil Engineers

William Douglas McLean

American Society of Mechanical Engineers Junior Membership Prize—for outstanding service to the Student Branch of the American Society of Mechanical Engineers

Richard Herckman Jones

John B. Carson Prize, $50—for the best record in professional courses in civil engineering

Carl Wayne Strayer

William H. Chandler Chemistry Prize, $25—to the highest ranking senior in chemistry and chemical engineering

Alfred Lincoln Rosener, Jr.

Cornelius Prize, $25—to the senior student in mechanical engineering who is judged to have profited most by his opportunities at Lehigh University

Richard Phillips Bodine

Philip Francis duPont Memorial Prizes—to the top ranking seniors in electrical engineering

First Prize, $100
Winslow Leroy Hurford

Second Prize, $50
Leon Linton Nonemaker

Harold J. Horn Prizes—for the best work in the senior electrical engineering proseminar

First Prize, $10
Jared Scott Smith

Second Prize, $5
Winslow Leroy Hurford

WILLIAMS PRIZE IN EXTEMPORE SPEAKING
  Second Prize, $50
    Edmund Warren Bowden, Jr.

WILLIAMS PRIZE IN INTRAMURAL DEBATING
  Second Prize, $80. Divided between:
    Charles Bernard Palmer
    Seemon Hayden Pines

WILLIAMS SENIOR PRIZES—for excellence of dissertations written on subjects in the fields indicated

Economics
  First Prize, $100
    Robert Daniel Wallick
  Third Prize, $25
    John Cornelius Beers
  Third Prize, $25
    Harvey Granville Hallenbeck, Jr.
English
  First Prize, $100
    Robert Polstein
  Third Prize, $25
    Joseph Robert Livingston Sterne
History and Government
  Second Prize, $50
    Sylvain Segal, Jr.
Psychology
  Second Prize, $50
    Emil William Klimack

PRIZES ANNOUNCED ON FOUNDER'S DAY, OCTOBER 10, 1948

WILLIAM H. CHANDLER CHEMISTRY PRIZES, $25—to the highest ranking student in each class in chemistry and chemical engineering

  Junior Year
    William John Dougherty
  Sophomore Year
    Fred Jerome Newhard, Jr.
  Freshman Year
    Robert Allen Sailor

ALUMNI JUNIOR PRIZES, $25—to the highest ranking juniors in each of the three colleges of the University

  Arts and Science
    Eugene Bennett Gallagher

Business Administration
George Robert Vogt

Engineering, one prize
John Sheldon Adam

Engineering, one prize
Harry Frederick Manbeck, Jr.

WILLIAMS JUNIOR PRIZES IN ENGLISH COMPOSITION
First Prize, $50
Thomas Gerard White

Second Prize, $25
Rheiner Thomas Hutchins II

Third Prize, $15
John Walter Jordan

WILBUR SCHOLARSHIP PRIZE, $200—to the highest ranking sophomore
Divided between:

George Robert Vogt
Carlyle Jones Roberts, Jr.

ALPHA A. DIEFENDERFER AWARD, Engraved Certificate—to the highest ranking sophomore in the course in analytical chemistry

Carlyle Jones Roberts, Jr.

WILLIAMS SOPHOMORE PRIZES IN ENGLISH COMPOSITION
First Prize, $50
Wright Britton

Second Prize, $25
Robert William Courtney

Third Prize, $15
Don Fisk Whittaker

ELECTRICAL ENGINEERING PRIZE, $15—to the highest ranking sophomore in electrical engineering

Charles Mollison Close

JOHN R. WAGNER AWARD, $15—to the highest ranking student in mechanical engineering during his first two years

John Moskowitz

WILBUR PRIZES, SOPHOMORE YEAR, $10— to the highest ranking sophomore in each of the fields indicated

English
Robert William Courtney

Mathematics
Richard Jason Orford

Physics
Carlyle Jones Roberts, Jr.

WILBUR PRIZES, FRESHMAN YEAR
  English, $15
    Robert Norman Taylor, Jr.
  French, $15
    Eugene Griffin Williams
  German, $15
    Thomas George Gabuzda
  Mathematics
    First Prize, $15
      Richard Marshall Allen
    Second Prize, $10. Divided between:
      Charles Adolph Barth, Jr.
      Joseph Bradley Moyer

IRVING SAMUELS PRIZE, $25—to the highest ranking freshman in the College of Business Administration

Edward Macrae Pope

WILLIAMS PRIZES IN EXTEMPORE SPEAKING
  Freshman Division
    First Prize, $50
      Dennis Francis Patrick Mullane
    Second Prize, $25
      David Clark Thompson
  Upper Classmen Division
    First Prize, $75
      Albert Harold Rubenstein
    Third Prize, $25
      Russell Newell Keppel

WILLIAMS PRIZES IN INTRAMURAL DEBATING
  First Prize, $120. Divided between:
    Robert Arthur Wharry
    Edwin Andrew Wallace

GOODMAN PRIZE IN FINE ARTS, $25—for special ability in creative work or in critical appreciation in fine arts

Kenneth Morley Wilson

ETA KAPPA NU PRIZE, Engineer's Handbook—to the highest ranking freshman in electrical engineering

William David Breingan

PI TAU SIGMA PRIZES, Engineer's Handbooks—to the highest ranking freshmen in the curricula of industrial engineering and mechanical engineering respectively

  Industrial Engineering
    James Irvin Bowman

Mechanical Engineering
Richard McElvain Elrick II

Tau Beta Prize, Engineer's Handbook—to the highest ranking freshman in engineering

Edwin Harold Hallberg

Phi Sigma Kappa Scholarship Cup—to the fraternity having the highest scholastic average for the preceding year

Tau Delta Phi

Trustees' Scholarship Cup—to the living group having the highest scholastic average for the preceding year

Tau Delta Phi

Register of Students
1948-1949

GRADUATE STUDENTS

Summer Half-Semester and Summer Sessions 1948

Alexy, David Daniel Thomas — Bethlehem
B.S., Moravian. Education.

Allgaier, Alice Ulshafer — Hazleton
B.S. in Elem. Ed., Pennsylvania State Teachers College (West Chester). Education.

Alperin, Joel Mitchell — Scranton
B.S. in Eng. Phys., Lehigh. Mathematics.

Andrews, Edward — Bethlehem
B.A., Lehigh. History.

Arnold, Charles Herbert — Broadheadsville
B.S. in Ed., Pennsylvania State Teachers College (East Strousburg). Education.

Bannan, Thomas Sheridan — Clearfield
B.A., Lehigh. English.

Barker, Clyde Edward — Parkersburg, W.Va.
A.B., Wesleyan (West Virginia). Education.

Barnard, Alfred James, Jr. — Roslindale, Mass.
B.S., Tufts; A.M., Harvard. Chemistry.

Bartholomew, William George — Catasauqua
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Beedle, Lynn Simpson — Bethlehem
B.S., California (Berkeley). Civil Engineering.

Behrens, Katherine Jean — Nazareth
B.S. in Ed., Pennsylvania State Teachers College (West Chester). Education.

Belzner, Edna Emmaline — Bethlehem
Ph.B., Muhlenberg. Education.

Benner, Patterson Dix — Allentown
B.A., Miami (Ohio); M.A., Lehigh. English.

Blanchard, Fletcher Augustus, Jr. — Cooperstown, N.Y.
B.S. in E.E., Union (New York). Electrical Engineering.

Blossom, Edward Ludlam — Baltimore, Md.
B.S. in E.E., Lehigh. Industrial Engineering.

Boyd, Edith deBurgh — Bethlehem
Ph.B., Muhlenberg. Education.

Boyd, Elizabeth Irene — Bethlehem
Ph.B., Muhlenberg. Education.

Brader, Henry Milton — Laureldale
B.S., Muhlenberg. Education.

Brown, Charles Ernest — Hellertown
B.S., Moravian; M.A., Lehigh. Education.

Brown, Franklin James — Bethlehem
A.B., Moravian. Education.

Brown, Mae Weaver — Hellertown
A.B., Moravian College for Women. History.

Brown, Theodore Aulenbach — Bethlehem
A.B., Moravian; M.A., Lehigh. Education.

Buckingham, Reed — Allentown
B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg). Education.

Cauffman, Paul Franklin — Bethlehem
B.S. in Ed., Pennsylvania State Teachers College (Shippensburg); M.A., Lehigh. Mathematics.

Chaudhuri, Mafizuddin Mohamed — Bogra, Bengal, Pakistan
B.S., Calcutta; M.S., Dacca. Chemistry.

Chellevold, John Olson — Bethlehem
A.B., St. Olaf; M.A., Northwestern. Mathematics.

Chen, Chien-huo — Shanghai, China
B.S., National Central University (China); M.S.E., Michigan. Civil Engineering.

Cherrington, Paul Leslie — Allentown
Ph.B., Muhlenberg. Education.

Chiles, Sinclair Wiggins — Bethlehem
B.S., Moravian. Education.

Chu, Chung Ming — Ipin, Szechuan, China
B.S., Nanking University. Electrical Engineering.

Chuang, Wen-Pin — Changchow, Kiangsu, China
B.S., Northwestern Engineering College (China). Metallurgy.

Condon, George Peter — Tulsa, Okla.
B.S., University of Athens. Chemistry.

Crownfield, Frederic Rudolph, Jr. — Guilford College, N. C.
A.B., Harvard. Physics.

deGroot, John Weert, Jr. — Camp Hill
B.S., Dickinson. Chemistry.

Deischer, Howard Knauss — Emmaus
Ph.B., Muhlenberg; M.A., Pennsylvania. Education.

DeMoyer, Robert — Easton
C.E., Lehigh; M.S., Swarthmore. Civil Engineering.

Detweiler, William Kenneth — Trumbauersville
B.S., Ursinus. Chemistry.

DeVinney, Russell Norman — Allentown
A.B., Muhlenberg. English.

DiMarcantonio, Richard Reynold — Martins Creek
B.S. in Ed., Villanova. Education.

Dimmick, Marcella Irene — Hellertown
A.B., Moravian College for Women. History.

Donchez, Anthony George A.B., Moravian. English.	Bethlehem
Donchez, Frank Leonard A.B., Moravian. English.	Bethlehem
Downs, James Douglas B.A., Lehigh. History.	Allentown
Earley, Miriam Lucy B.S., Muhlenberg. Education.	Bethlehem
Eckhart, Clyde George B.S., Moravian. Chemistry.	Bethlehem
Evans, Granville Robert A.B., Moravian. Education.	Bangor
Evans, Lucille Betty B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.	Fullerton
Evans, Ruth Beck B.S. in Ed., Pennsylvania State Teachers College (West Chester). Education.	Hellertown
Evans, Winton Chauncey B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.	Schuylkill Haven
Fatzinger, Paul William A.B., Muhlenberg. Education.	Allentown
Fenstermacher, James Max B.S., Muhlenberg. Education.	Topton
Fox, Leonard Pincus B.S. in Ch.E., Lehigh. Chemical Engineering.	Brooklyn, N.Y.
Freeman, John Bass A.B., Muhlenberg. Chemistry.	Allentown
Friend, Ralph Abraham, Jr. A.B., Moravian. History.	Bethlehem
Gamble, Ernest, Jr. B.S. in Ch.E., M.S., Lehigh. Chemistry.	Bethlehem
Getz, Pauline Vivian B.S. in Ed., Muhlenberg. English.	Bethlehem
Gilchrist, Lois Cowley A.B., Utah. English.	Bethlehem
Gossy, Guido Joseph B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.	Allentown
Gould, Arthur Freeman S.B., Massachusetts Institute of Technology. Industrial Engineering.	Hellertown
Grabarkiewicz, Donald George B.S., Michigan State. Chemistry.	Allentown

Green, William Asa Bethlehem
B.S., Moravian; M.S., Lehigh. Bacteriology.

Griffin, William Pollard, Jr. Westerly, R. I.
Ph.B., Muhlenberg. Education.

Hannan, John Francis Manhasset, N.Y.
B.S. in Ch.E., Lehigh. Chemistry.

Harding, Robert Adamson Kingston
A.B., Syracuse; M.A., Lehigh. English.

Harris, Basil Edward Galeton
B.S. in Ed., Pennsylvania State Teachers College (Mansfield). Education.

Hartwig, Robert Andrew, Jr. Tamaqua
B.S. in Ed., Pennsylvania. Education.

Heck, Theodore Guy Bethlehem
B.A., Lehigh. English.

Heinbach, Stanley Thomas Cressona
B.S. in Ed., Pennsylvania State Teachers College (Kutztown); M.A., Lehigh. Education.

Hess, Donald Charles Bethlehem
B.S. in Ed., Pennsylvania State Teachers College (Indiana). Education.

Hibbard, Wilbur Hellertown
B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg); M.A., Columbia. Mathematics.

Horn, Paul Eugene Pennsburg
B.S. in Ed., Pennsylvania State Teachers College (West Chester). Education.

Houck, Luther Kotz Wind Gap
B.S. in Ed., Muhlenberg. Education.

Hsu, Hsi Shanghai, China
B.S., National University of Chekiang. Chemical Engineering.

Hunsberger, Isaac Moyer Quakertown
B.S. in Chem., M.S., Lehigh. Chemistry.

Huyett, Richard Caldwell Birdsboro
B.S. in M.E., Lehigh. Mathematics.

Imel, James Attix Easton
A.B., Lafayette. History.

Jacobsen, Jacob Thorsten Camden, N.J.
B.S. in C.E., Lehigh. Civil Engineering.

Jeffery, Ronald Henry Fair Haven, N.J.
B.S. in Ch.E., Lehigh. Chemistry.

Johnson, Donald Seiz Collegeville
B.S. in M.E., Lehigh. Mathematics.

Johnson, Ralph Richard. Easton
B.A., Lehigh. Education.

Johnson, William Dexter Allentown
B.A., Minnesota; M.S., Lehigh. Chemistry.

Jones, Alan Francis Philadelphia
B.A., Lehigh. Education.

Jones, Harold Trainer Allentown
B.A., Washington Missionary College. Mathematics.

Jones, Mark Martin Scranton
B.S. in Chem., Lehigh. Chemistry.

Keihn, Frederick George Clarks Summit
B.S., Randolph-Macon. Chemistry.

Keiser, William Edwin Allentown
B.S. in Chem., Lehigh; M.S., Pennsylvania. Chemistry.

Kelly, William Edward Merrick, N.Y.
A.B., Hofstra. Chemistry.

Kenvin, Boyd Getzinger White Haven
A.B., Lafayette. Education.

Kenyon, Franklin Edmund Allentown
B.Ed., New York State Teachers College (Cortland); M.A., Lehigh. English.

Kleinschmidt, Robert Baumgartner Bethlehem
B.S. in C.E., M.S. in C.E., M.A., Pennsylvania. Civil Engineering.

Knudsen, Knud-Endre Oslo, Norway
C.E., Technical Institute of Norway. Civil Engineering.

Kutsher, George Samuel Reading
B.S., Albright. Chemistry.

Landis, Kenneth Maynard Easton
B.S. in Ed., Muhlenberg. Education.

Lark, Miriam Ruth Stroudsburg
B.S., Pennsylvania State. Education.

Larkin, John Frederick Mt. Bethel
B.C.E., Manhattan. Civil Engineering.

Laubach, William Nace Northampton
Ph.B., Muhlenberg. Education.

Lee, Thomas Edward Pen Argyl
B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.

Liebig, John Orth, Jr. Allentown
B.S. in C.E., Lehigh. Civil Engineering.

Lobb, William Lucas Bethlehem
A.B., Moravian. Education.

Lower, George William Oswego, N.Y.
A.B., Syracuse; M.S., Lehigh. Chemistry.

Malsberger, Richard Griffith Bethlehem
B.A., Lehigh. Bacteriology.

Manderbach, Harry John — Reading
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Manone, Carl Joseph — Hellertown
B.A., Lehigh. Education.

Marcincin, Paul Matthew — Bethlehem
A.B., Moravian. History.

Marini, John William — Bethlehem
B.S. in Eng. Phys., Lehigh. Physics.

Maxwell, John Walter — Bethlehem
B.S., Lehigh. International Relations.

McDonnell, Robert William — Englewood, N.J.
B.S. in Ch.E., Bucknell. Chemical Engineering.

Meck, William M. — Quakertown
B.S. in Ed., Pennsylvania State Teachers College (Kutztown); M.A., Lehigh. Education.

Metro, Stephen Joseph — Lebanon
B.S., Lebanon Valley. Chemistry.

Mettler, James William — Bethlehem
A.B., A.M., Bucknell. Mathematics.

Michels, Julian Getz — Allentown
B.S. in Chem., Georgia; M.S., Tennessee. Chemistry.

Mikovsky, Richard Joseph — Trenton, N.J.
B.S. in Chem., Lehigh. Chemistry.

Miller, Earl Wilson — Bethlehem
Ph.B., Muhlenberg. History.

Miller, Harry Kreiger, Jr. — Hummelstown
B.S. in Chem., Lebanon Valley. Psychology.

Miller, Paul Edward George — Bethlehem
B.S., Moravian. Chemistry.

Mock, Florence Esther — Emmaus
A.B., Muhlenberg. History.

Morris, Mary Jane — Bethlehem
B.A., Pennsylvania State. Education.

Moyer, Florence N. — Bethlehem
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Nace, Donald Miller — Hanover
B.S. in Ch.E., Lehigh. Chemistry.

Neal, Russell Elwood — Bethlehem
B.S. in C.E., Lehigh. Civil Engineering.

O'Brien, Joseph Francis — Lebanon, N.J.
B.A., Lehigh. Chemistry.

Ohdedar, Ananta Kumar — Benares, India
B.S., M.S., Benares Hindu University. Chemistry.

Oplinger, Arthur John Griffith Ph.B., Muhlenberg; M.A., Lehigh. Education.	Hellertown
Osborn, Cyril John B.Met.E., Melbourne. Metallurgical Engineering.	Melbourne, Australia
Pandit, Vasant Pratap B.S., Bombay. Chemistry.	Bombay, India
Pe, Maung Hla B.S., Rangoon. Electrical Engineering.	Kanbalu, Burma
Pennington, Donald Bond B.S. in M.E., Duke. Mechanical Engineering.	York
Polinsky, John Richard B.A., Lehigh. Education.	Forty Fort
Pollock, Daniel David B.S. in Ed., Temple. Metallurgy.	Philadelphia
Powers, Arthur Eugene B.S. in Met.E., Purdue. Metallurgy.	Westport, Conn.
Price, Thomas John B.S. in Ed., Pennsylvania State Teachers College (Shippensburg). Education.	Coopersburg
Prutzman, Robert Louis A.B., Muhlenberg. Education.	Allentown
Quier, Dorothy Harriet B.S. in Ed., Pennsylvania State Teachers College (East Strousburg). Education.	Hellertown
Rao, Tipirneni Rajagopal B.S., M.S., Benares Hindu University. Chemistry.	Bezwada, India
Rausch, Paul Charles Ph.B., Muhlenberg. History.	Allentown
Rawson, Roger B.S., Clemson. Mechanical Engineering.	Green Lane
Reber, Wayne Albert B.S., Muhlenberg. History.	Weissport
Richards, Marvin Sherrill B.S.E., Princeton. Chemistry.	Somerville, N.J.
Ritter, Alan A. B.S., Muhlenberg; M.A., Pennsylvania State. Education.	Weatherly
Ritter, Hope Thomas Martin, Jr. A.B., Cornell; M.S., Lehigh. Bacteriology.	Allentown
Rivard, Donald Ellsworth B.S., Tufts. Chemistry.	Provincetown, Mass.
Roald, Bernt Ch.E., Technical University of Norway. Metallurgy.	Aalesund, Norway
Rohrer, Walter Thomas A.B., Catawba. Education.	Springtown

Romig, Lucy Frances Allentown
B.A., Moravian College for Women. Education.

Rothenberger, Otis Jacob Allentown
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Rothermel, Charles Edward, Jr. Wilmington, Del.
B.S., Washington College. Chemistry.

Rudzinski, John Francis Elizabeth, N.J.
B.S., Albright. Chemistry.

Sanders, Donald George Passaic, N.J.
B.S. in M.E., Lehigh. Mechanical Engineering.

Sawyer, Edwin Albert Winston-Salem, N. C.
B.S. in Bus. Adm., Lehigh; B.D., Moravian Theological Seminary. English.

Schadel, Willard Harry Pen Argyl
A.B., Susquehanna. Education.

Schleicher, Russell Franklin Palmerton
B.S., Pennsylvania State. Education.

Schmoyer, Marjorie Marcks Emmaus
Ph.B., Muhlenberg. Education.

Schneck, Stanley Franklin Orefield
B.S. in Ed., Pennsylvania State Teachers College (Millersville). Education.

Schneider, Robert William Staten Island, N.Y.
B.S. in Ch.E., Lehigh. Chemical Engineering.

Schneller, Warren Schafer Catasauqua
B.S., Muhlenberg. Education.

Schucker, Paul William Lenhartsville
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Scotchbrook, Adrienne Frances Scranton
B.S., Rutgers. Metallurgy.

Seals, Richard Bell Bethlehem
B.A., Lehigh. History.

Sebring, Walter Hudson Tannersville
B.S., Pennsylvania State; M.A., Lehigh. Education.

Seebald, Henry Albert Allentown
B.A., Lehigh. Mathematics.

Seese, Gladys Bender Canadensis
B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.

Sharp, Ruth Arndt Phillipsburg, N.J.
A.B., Wilson. Education.

Shaw, Robert Saxton, Jr. West Grove
B.A., Pennsylvania State. English.

Shay, George Clinton Bethlehem
M.E., Stevens Institute of Technology. Mechanical Engineering.

Sherman, Edward Chicago, Ill.
B.S. in Chem., Illinois; M.S., Lehigh. Chemistry.

Shoemaker, Richard Nelson Allentown
B.S., Lafayette; M.S., Lehigh. Bacteriology.

Skinner, Watson Wene, Jr. Allentown
B.S., Muhlenberg. Education.

Smith, Shaler Gordon Rockford, Ill.
B.S. in Ch.E., Massachusetts Institute of Technology. Chemistry.

Snyder, Herman Peter Neffs
B.S., Muhlenberg. Education.

Spohn, Robert Harry Bethlehem
A.B., Lebanon Valley. Mathematics.

Steager, Edward Allen Freemansburg
A.B., Moravian. English.

Storch, Frederick Edward Catasauqua
Ph.B., Muhlenberg. Education.

Story, Richard Morgan, Jr. Bethlehem
B.S. in M.E., Vermont. Industrial Engineering.

Strouse, William Moss Bethlehem
B.S. in Eng. Phys., Lehigh. Physics.

Thielsch, Helmut Overton, Texas
B.S., Alabama Polytechnic Institute. Metallurgy.

Thomas, Ethel Slatington
B.S., Muhlenberg. Education.

Thomas, Willis Grant, Jr. Allentown
B.A., Lehigh. Chemistry.

Thorstensen, Thomas Clayton Bethlehem
B.S., Minnesota; M.S., Lehigh. Chemistry.

Tikson, Michael Youngstown, Ohio
B.S., Youngstown. Mathematics.

Travers, George Clifton, Jr. Bethlehem
B.S. in Ch.E., Northeastern. Chemical Engineering.

Uhl, Vincent William Bethlehem
B.S. in Ch.E., Drexel Institute of Technology. Chemical Engineering.

Wagner, Nathan George Palmerton
B.S. in Ed., Pennsylvania State Teachers College (West Chester). History.

Wall, Edward Thomas Freeport, N.Y.
B.S. in E.E., Purdue. Electrical Engineering.

Way, Robert Wallace Allentown
B.S., Muhlenberg. Chemistry.

Weaver, Carolyn Bealer Bethlehem
A.B., Moravian College for Women. English.

Weber, Miriam Lovina — Bethlehem
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Wehby, LaVern Joe — Longmont, Colo.
B.S. in M.E., Colorado. Industrial Engineering.

Weida, Robert Lincoln — Elmhurst, N.Y.
B.S. in Eng. Phys., Lehigh. Physics.

Weikel, Richard Fair — Pottstown
B.S. in Econ., Pennsylvania. History.

Welliver, Robert Arthur — Allentown
B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg). Education.

Wells, Samuel Owen III — Stroudsburg
B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.

Werkheiser, Harry Earl — Tannersville
B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.

Wessner, Wayne George — Oley
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

White, William Beckler — Waynesboro, Va.
B.S., B.A., Hampden-Sydney; M.A., Lehigh. English.

Whittier, Frank Weston — Bethlehem
B.S. in M.E., Cornell. Mechanical Engineering.

Williams, John Lewis — Bangor
B.S., Moravian. Education.

Woods, James William — Winnetka, Ill.
B.S. in Chem., M.S., Lehigh. Chemistry.

Workman, Donald Atlee — Frostburg, Md.
A.B., Muhlenberg. History.

Wynne, Arnold Francis — Bangor
B.S., Ursinus. Education.

Yang, Ching-Huan — Liling, China
B.S., National Central University (China). Civil Engineering.

Yelavarthy, Nayudamma — Madras, India
B.S., Benares Hindu University. Chemistry.

Young, Ralph Waldo — Bethlehem
A.B., Ball State Teachers College; M.S., Indiana. Mathematics.

Zaengle, Lambert Francis — Mauch Chunk
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.

Zickel, John — Bethlehem
B.S. in M.E., Lehigh. Mathematics.

Fall and Spring Semesters 1948-1949

Adams, James Eugene Bethlehem
A.B., Moravian. History.

Allgaier, Alice Ulshafer Hazleton
B.S. in Ed., Pennsylvania State Teachers College (West Chester). Education.

Alperin, Joel Mitchell Scranton
B.S. in Eng. Phys., Lehigh. Mathematics.

Ananthanarayanan, Narayana Iyer Trichinopoly, India
B.S., Madras. Metallurgy.

Andrews, Edward Bethlehem
B.A., Lehigh. History.

Arey, Richard Walton Independence, Kans.
B.S., U. S. Naval Academy. Chemical Engineering.

Arndt, Norman Vinton Pottstown
B.S. in Ed., Pennsyvania State Teachers College (East Stroudsburg). Education.

Ashbaugh, Laura McDonough Bethlehem
B.A., M.A., Pennsylvania. Mathematics.

Ashley, Robert Edward Kintnersville
B.S. in C.E., Lehigh. Civil Engineering.

Avery, Eugene Cone Chicago, Ill.
B.S. in Eng. Phys., Lehigh. Physics.

Ayres, Alfred Humbert Bowers
A.B., Muhlenberg. Education.

Ba-Hli, Freddy Rangoon, Burma
B.S., Rangoon. Electrical Engineering.

Baker, Barbara Bethlehem
A.B., Brown. Mathematics.

Baker, Richard Alan Allentown
B.S. in Ch.E., Lehigh. Chemistry.

Balentine, William Howard Hellertown
B.S. in E.E., Newark College of Engineering. Electrical Engineering.

Barnard, Alfred James, Jr. Roslindale, Mass.
S.B. in Chem., Tufts; A.M., Harvard. Chemistry.

Bartlett, Bertram Francis Bethlehem
B.A., Lehigh. Finance.

Bartron, Lester Ray Easton
B.S. in Ch.E., Lehigh. Chemistry.

Beaupre, Walter Joseph Bethlehem
A.B., Bates. English.

Becker, Earl Arthur Allentown
B.S. in Ed., Pennsylvania State Teachers College (Kutztown); M.A., Lehigh. Education.

Becker, Harold Leo B.S., B.S. in C.E., Duke. Civil Engineering.	Bethlehem
Beedle, Lynn Simpson B.S. in C.E., California (Berkeley). Civil Engineering.	Bethlehem
Beeler, David Orr A.B., Harvard. Geology.	Bardstown, Ky.
Behrens, Katherine Jean B.S. in Ed., Pennsylvania State Teachers College (West Chester). Education.	Nazareth
Belmonte, Robert Michael B.S. in Eng. Phys., Lehigh. Physics.	Bogota, N.J.
Benner, Patterson Dix B.A., Miami (Ohio); M.A., Lehigh. English.	Allentown
Benson, Leon A.B., New York University. Mathematics.	Allentown
Bergenback, Richard Edward A.B., Lafayette. Geology.	Bethlehem
Berkemeyer, Mary Frances A.B., Cedar Crest. English.	Bethlehem
Berkowitz, Jerome B.S. in Ed., Ohio State. Psychology.	Cleveland, Ohio
Billy, J. Albert A.B., Muhlenberg. History.	Northampton
Blanchard, Fletcher Augustus, Jr. B.S. in E.E., Union (New York). Electrical Engineering.	Easton
Blanchard, Grace Hayden B.S., B.M., Skidmore. Education	Northville, N.Y.
Bleiler, Richard Stephen B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.	Bethlehem
Blynn, Oscar Monroe B.S. in Ed., Pennsylvania State Teachers College (Shippensburg). M.A.,Lehigh. Education.	Palmerton
Bolmer, Dorothy Constance A.B., New Jersey College for Women; M.A., Lehigh. History.	Princeton, N.J.
Boyd, Edith deBurgh Ph.B., Muhlenberg. Education.	Bethlehem
Boyd, Elizabeth Irene Ph.B., Muhlenberg. Education.	Bethlehem
Boyle, Thomas Allan, Jr. B.M.E., Fenn. Mechanical Engineering.	Easton
Brader, Henry Milton B.S., Muhlenberg. Education.	Newark, Del.
Bradner, William Turnbull B.A., Lehigh. Bacteriology.	Short Hills, N.J.

Bray, William Edwin	Bethlehem	B.A., Lehigh. Education.
Bresler, Martin Arthur	Allentown	B.S., Columbia. Electrical Engineering.
Brown, Charles Ernest	Hellertown	B.S., Moravian; M.A., Lehigh. Education.
Brown, Franklin James	Bethlehem	B.S., Moravian. Education.
Brown, Grace Theresa	Allentown	A.B., Moravian College for Women. History.
Brown, Mae Weaver	Hellertown	A.B., Moravian College for Women. History.
Brown, Theodore Aulenbach	Bethlehem	A.B., Moravian; M.A., Lehigh. Education.
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A.B., Moravian. English.

Sherman, Edward — Chicago, Ill.
B.S. in Chem., Illinois; M.S., Lehigh. Chemistry.

Shermer, David Alan — Philadelphia
B.S. in Ch.E., Lehigh. Chemical Engineering.

Shimer, William Robert — Bethlehem
A.B., Lafayette. English.

Shipman, Margaret — Belvidere, N.J.
A.B., Columbia. Biology.

Shoemaker, Richard Nelson — Allentown
B.S., Lafayette; M.S., Lehigh. Bacteriology.

Shook, Theodore Albert — Bethlehem
B.S. in Eng. Phys., Lehigh. Physics.

Shover, Paul Herbert — Allentown
B.S., Muhlenberg. Education.

Shumaker, Jane Elizabeth — Allentown
A.B., Ursinus. History.

Shreve, James Downs, Jr. — Lancaster
B.S., Franklin and Marshall. Physics.

Silvestri, Herbert Horatius — Peckville
B.S., Albright. Chemistry.

Smith, Danilo Coelho — Porto Alegre, Brazil
C.E., Rio Grande do Sul. Civil Engineering.

Smith, Frances Jane — Coopersburg
B.S., Moravian College for Women. Bacteriology.

Smith, Richard Thomas — Allentown
B.S. in E.E., M.S., Lehigh. Electrical Engineering.

Smith, Shaler Gordon, Jr. — Rockford, Ill.
B.S. in Ch.E., Massachusetts Institute of Technology. Chemistry.

Smullin, Charles Frederick — Hellertown
B.S. in Ch.E., M.S., Lehigh. Chemistry.

Snyder, Charles Morris — Bethlehem
A.B., Moravian. Education.

Snyder, Roy Kermit — Macungie
A.B., Moravian. History.

Somerville, John Jeffrey — Bethlehem
B.S. in Bus. Adm., Lehigh. History.

Spohn, Robert Harry — Bethlehem
A.B., Lebanon Valley; M.A., Lehigh. Mathematics.

Steager, Edward Allen — Freemansburg
A.B., Moravian. English.

Steinhart, Ralph Gustave, Jr. — Bethlehem
B.S. in Chem., Lehigh; B.S. in Ch.E., Virginia Polytechnic Institute; M.S., Lehigh. Chemistry.

Stettler, Russell Jonathan — Wescosville
B.S. in Ed., Pennsylvania State Teachers College (Kutztown). History.

Stevenson, Dean Theodore — Bethlehem
B.A., Lehigh; B.D., General Theological Seminary. Philosophy.

Stevenson, Robert Evans — Bethlehem
B.S., University of Hawaii; M.S., Washington State. Geology.

Stevenson, Thelma Murray — Bethlehem
B.S., Montana State. History.

Stirzaker, John Leslie — Allentown
A.B., Gettysburg. Philosophy.

Story, Richard Morgan, Jr. — Mansfield Center, Conn.
B.S. in M.E., Vermont. Industrial Engineering.

Strauss, Harry Alfred — Allentown
B.S., Muhlenberg; M.A., Lehigh. Education.

Strauss, Lewis Hanauer — Brandy, Va.
A.B., Harvard. Physics.

Strouse, William Moss — Bethlehem
B.S. in Eng. Phys., Lehigh. Physics.

Stump, William Lester — Bethlehem
B.S. in Ch.E., M.S., Lehigh. Chemistry.

Sutton, Luther Gerald — Lemoyne
B.S. in Ed., Pennsylvania State Teachers College (Millersville). Physics.

Swayne, Kenneth Gilbert B.S. in M.E., M.S., Lehigh. Mechanical Engineering.	Newtown
Taylor, Russell Norman A.B., Colgate. Geology.	Cuba, N.Y.
Theile, Kenneth William B.S. in Ch.E., Lehigh. Chemical Engineering.	Tenafly, N.J.
Thielsch, Helmut B.S., Alabama Polytechnic Institute. Metallurgy.	Overton, Texas
Thomas, Ethel B.S., Muhlenberg. Education.	Slatington
Thomas, Willis Grant, Jr. B.A., Lehigh. Chemistry.	Allentown
Thorstensen, Thomas Clayton B.S., Minnesota; M.S., Lehigh. Chemistry.	Red Wing, Minn.
Thürlimann, Bruno Dipl. Ing., Federal Polytechnic Institute (Switzerland). Civil Engineering.	Gossau, Switzerland
Tikson, Michael B.S., Youngstown. Mathematics.	Youngstown, Ohio
Tooker, Edwin Wilson B.S., Bates. Geology.	Littleton, Mass.
Topfer, Alvin Richard B.S., Ursinus. Physics.	Bethlehem
Topractsoglou, Anastasios Anthony B.S. in C.E., Robert College; M.S., Minnesota. Civil Engineering.	Athens, Greece
Townsend, Robert René B.S., Muhlenberg. Mathematics.	Allentown
Travers, George Clifton, Jr. B.S. in Ch.E., Northeastern. Chemical Engineering.	Bethlehem
Uhl, Vincent William B.S. in Ch.E., Drexel Institute of Technology. Chemical Engineering.	Bethlehem
Ulubay, Ali B.S., University of London. Metallurgy.	Konia, Turkey
Vogel, Luther Henry A.B., Muhlenberg; B.D., Lutheran Theological Seminary at Philadelphia. Education.	Richlandtown
Walker, Frederick John B.S.E., Brown. Electrical Engineering.	Fairfield, Conn.
Wall, Edward Thomas B.S. in E.E., Purdue. Electrical Engineering.	Freeport, N.Y.
Warmkessel, Carl Andrew B.A., M.S., Lehigh. Geology.	Fogelsville
Warren, Donald B.S. in Met.E., Kentucky. Metallurgy.	Staten Island, N.Y.

Way, Robert Wallace B.S., Muhlenberg. Chemistry.	Allentown
Weaver, Glenn A.B., Catawba; B.D., Theological Seminary of the Reformed Church; M.A., Lehigh. History.	Bethlehem
Weaver, Marvin Paul B.S., Albright. Chemistry.	Bethlehem
Webster, Anna Thomas A.B., Ursinus. Education.	Slatington
Wehby, Lavern Joe B.S., Colorado. Industrial Engineering.	Longmont, Colo.
Weida, Robert Lincoln B.S. in Eng. Phys., Lehigh. Physics.	Elmhurst, N.Y.
Weikel, Richard Fair B.S. in Econ., Pennsylvania. History.	Pottstown
Welliver, Robert Arthur B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg). Education.	Allentown
Wells, Samuel Owen III B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.	Stroudsburg
Werkheiser, Harry Earl B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). Education.	Tannersville
Wessner, Wayne George B.S., in Ed., Pennsylvania State Teachers College (Kutztown). Education.	Oley
Weston, Thomas Robert B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg). History.	Bethlehem
Wetmore, William Hall B.S. in M.E., Duke; M.S., Lehigh. Mechanical Engineering.	Washington, D.C.
Whittier, Frank Weston B.S. in M.E., Cornell. Mechanical Engineering.	Bethlehem
Wilbur, Charles Roger B.S. in M.E., Stevens Institute of Technology. Mechanical Engineering.	Durham, N.C.
Wilker, Conrad Robert B.S., Muhlenberg; M.A., Lehigh. Education.	Palmerton
Williams, David Rowley B.S. in M.E., Drexel Institute of Technology; M.S., Lehigh. Mechanical Engineering.	Bethlehem
Williams, Jay David B.S., Albright. Education.	Quakertown
Williams, John Lewis B.S., Moravian. Education.	Bangor

Williams, Marjorie Raines B.S., Pennsylvania State. Chemistry.	Easton
Williamson, William Bedford B.S. in Ed., S.T.B., Temple; S.T.M., Lutheran Theological Seminary at Philadelphia. History.	Bath
Woelfel, Ralph Hartman, Jr. B.A., Lehigh. Bacteriology.	Hazleton
Wolf, Donald Alan B.S. in Ch.E., Lehigh. English.	Cedar Rapids, Iowa
Woodruff, Stephen Clarke B.S. in Met.E., Lehigh. Metallurgy.	Nazareth
Woods, Helen Curtis B.A., Moravian College for Women. English.	Winnetka, Ill.
Woods, James William B.S. in Chem., M.S., Lehigh. Chemistry.	Winnetka, Ill.
Wynne, Arnold Francis B.S., Ursinus. Education.	Bangor
Yang, Ching-Huan B.S., National Central University of China. Civil Engineering.	Liling, Hunan, China
Yelavarthy, Nayudamma B.S., Benares Hindu University; M.S., Lehigh. Chemistry.	Madras, India
Young, George Logan B.S., Muhlenberg; M.A., Lehigh. History.	Hellertown
Young, Thomas Edwin B.S. in Ch.E., Lehigh. Chemistry.	Manheim
Yu, Ai-Ting B.S., National Central University of China; M.S., Massachusetts Institute of Technology. Civil Engineering.	Cobleskill, N.Y.
Zaphiropoulos, Renn B.S. in Eng. Phys., Lehigh. Physics.	White Plains, N.Y.
Zell, Quentin Evans Ph.B., Muhlenberg. Education.	Bethlehem
Zettelmoyer, Karl Albert B.S. in Ed., Pennsylvania State Teachers College (Kutztown). Education.	Palmerton
Zickel, John B.S. in M.E., Lehigh. Mathematics.	Bethlehem
Zollinger, Walter Frederick B.A., Virginia; B.S., Moravian. Chemistry.	Bethlehem

UNDERGRADUATE STUDENTS

Arts—Arts and Science
Bus.—Business Administration
Ch.E.—Chemical Engineering
Chem.—Chemistry
C.E.—Civil Engineering
E.E.—Electrical Engineering
E.M.—Mining Engineering
E.P.—Engineering Physics
G.C.D.—General College Division
I.E.—Industrial Engineering
M.E.—Mechanical Engineering
Met.E.—Metallurgical Engineering

Summer Half-Semester and Summer Sessions 1948

*Abel, Rebecca Frey		Bath
*Abele, Walter Mullin		Bethlehem
Abicht, Wolfram Arthur	M.E.-Feb.'50	Berkshire Heights
*Acker, Erma Alverta		Walnutport
Adam, John Sheldon	M.E.-June'49	Prospect Park
Adams, Douglas Strickland	E.E.-June'49	Upper Montclair N.J.
Adams, Elmer Haney	Bus.-June'51	New York, N.Y.
Ahern, Andrew George, Jr.	I.E.-June'50	Philadelphia
Ahern, John Francis	E.P.-June'49	Philadelphia
Ahrenhold, Henry III	C.E.-Feb.'51	Manhasett, N.Y.
Ainslie, Cowgill Donn	Bus.-June'49	East Orange, N.J.
Aitken, Alfred Hetherington	E.P.-June'49	New York, N.Y.
Albrecht, Robert Henry	I.E.-June'51	Highlands, N.J.
Alexy, Paul James	Bus.-Oct.'48	Bethlehem
Aley, Merry Joy		Bethlehem
†Allen, George John	E.M.-Feb.'51	Hazleton
Allen, George Wilbur	E.P.-June'49	Budd Lake, N.J.
Allen, John Edward	I.E.-June'51	Englewood, N.J.
Allen, Wesley Edward	Ch.E.-June'50	Brooklyn, N.Y.
*Altemose, Mary Alice		Nazareth
Ament, Miles Kendig	I.E.-Feb.'49	Lancaster
Amish, John Stuart	Bus.-Feb.'52	Webster, N.Y.
Anders, James Edward	M.E.-June'50	Bethlehem
Anders, Patrick Lloyd	Arts-Feb.'49	Bethlehem
Anderson, Frank Olaus	I.E.-June'50	Bemus Point, N.Y.
Anderson, Robert Edward Lee	M.E.-Feb.'52	Lancaster
*Andress, Thelma		Palmerton
Andrews, Chester Carl	M.E.-June'51	Allentown
Arbizzani, Amedeo	C.E.-June'49	Bethlehem
Arnold, Herbert Stephen, Jr.	M.E.-June'50	Lebanon
Arrison, Frank Christian	Arts-June'50	Philadelphia
Ashley, Milton Vincent, Jr.	I.E.-Oct.'48	Iselin, N.J.
Assetto, Valentino John	C.E.-June'49	West Chester
Attaway, John Rush	Bus.-Feb.'49	Charleston, S. C.
Auld, Andrew Jackson		Bethlehem
Baier, Brooke Rishe	M.E.-Feb.'49	Palmyra
Baines, Ernest Leh	E.E.-June'49	Allentown
Baker, Dexter Farrington	M.E.-June'50	Landsdowne
Baker, Richard Alan	Ch.E.-Feb.'49	Allentown
Baldwin, Stiles Robert	Bus.-Oct.'48	Delaware Water Gap
Baltrus, John Robert	Ch.E.-June'50	Wilkes-Barre
Banks, Vere James	I.E.-Oct.'48	Stroudsburg
Barbato, Theodore, Jr.	Bus.-Feb.'50	White Plains, N.Y.
Barbosa, Marquita		Bethlehem

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*Summer Session.
†Summer Engineering Courses.

Barclay, Thomas Desmond	M.E.-June'49	North Wales
Barnes, Joseph Thomas, Jr.	M.E.-Feb.'52	Allentown
Barr, James Fleming, Jr.	Bus.-June'51	Philadelphia
Barron, William Thomas	E.E.-June'49	Allentown
Barry, Thomas Rogers	Bus.-Feb.'50	Lambertville, N.J.
Bartholomew, Frank Stewart	Bus.-June'49	Westfield, N.J.
Baskerville, Edward John	Ch.E.-Feb.'50	Paterson, N.J.
*Barton, Sarah Elizabeth		Bethlehem
Bausman, James Warren	Bus.-Oct.'48	Allentown
Be, Stanley Wie Go	Ch.E.-Feb.'52	Brooklyn, N.Y.
†Bechtel, Rodney E.	C.E.-June'51	Bethlehem
Beck, Robert Edward	Bus.-Feb.'50	Englewood, N.J.
*Becker, Dorothea Frances		Bethlehem
†Becker, Edward Paul	C.E.-June'51	Bethlehem
Bedell, David Scarlett	Bus.-June'51	Upper Montclair, N.J.
Bellante, Emidio Lawrence	I.E.-Feb.'49	Easton
Belmont, Thomas Simon	Arts-June'49	Herkimer, N.Y.
*Bennett, William Fegley Ph.B., Muhlenberg		Northampton
Berry, David Larmer	Bus.-June'50	Bethlehem
*Bertrand, John Henry, Jr.		Easton
Betts, Herbert Patterson, Jr.	Bus.-Feb.'49	Madison, N.J.
Betz, George Ludwig	C.E.-Oct.'48	Philadelphia
Bevier, Louis Wells	I.E.-June'51	Scarsdale, N.Y.
Bewley, Donald Thomas	E.E.-Feb.'50	Bethlehem
Bewley, Robert Lynn	Bus.-Feb.'49	Bethlehem
Bharucha, Faredoon Khurshed	Met.E.-June'51	Jamshedpur, India
Bickel, James Gerald	Ch.E.-Feb.'49	Allentown
Bickle, Robert Sheldon	M.E.-June'49	Bethlehem
Bigelow, Daniel Edward	M.E.-Oct.'48	Buffalo, N.Y.
Billhimer, Robert Dale	Bus.-Feb.'51	Manhasset, N.Y.
Bills, Robert Arthur	C.E.-June'51	Wayne, Michigan
Binns, George Hindle	Ch.E.-June'49	Bethlehem
Bitz, Anna Rebecca		Pen Argyl
Blanchard, Grace Hyden		Northville, N.Y.
Bleiler, Richard S.		Allentown
Boerner, Stewart Benjamin, Jr.	M.E.-June'50	Roslyn
*Boettger, Betty Jean		Allentown
Bond, John Henry, Jr.	C.E.-June'50	Bethlehem
†Bond, Robert Naile	C.E.-Feb.'51	Reisterstown, Md.
Borzellino, Salvatore	Arts-June'49	Paterson, N.J.
Bovankovich, John Carl	Ch.E.-Feb.'51	Monessen
Bowen, Henry Deifer, Jr.	Ch.E.-Feb.'50	Allentown
Bower, Richard Harding	E.E.-June'49	Nescopeck
Bowes, Richard Moss	Bus.-Oct.'48	Bethlehem
Bowler, Richard Kyle	C.E.-Feb.'51	Pelham Manor, N.Y.
Bowman, James Irvin	I.E.-June'51	Middletown
†Boyer, David Lentz	Bus.-June'50	Allentown
Boyer, John Harry	Bus.-Feb.'49	Wilkes-Barre
Boyer, Thomas Edward		Bethlehem
Boyer, William Stanley	Bus.-Feb.'49	Allentown
Boyle, Edward Baxter, Jr.	E.E.-Feb.'50	West Englewood, N.J.
*Boyle, Mary Wilson		Hazleton

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*Summer Session.
†Summer Engineering Courses.

Boyle, Richard James	Bus.-Oct.'48	Bethlehem
Brady, George Leonard	C.E.-Feb.'49	Freeport, N.Y.
†Branch, Richard	E.M.-June'49	Nesquehoning
†Brandt, Henry William	E.M.-June'50	Scranton
Breck, William Rogers, Jr.	Arts-June'50	Rosemont
Brennan, Thomas Matthew	C.E.-June'51	Utica, N.Y.
Brenner, Frank	Arts-Oct.'48	New York, N.Y.
Brew, Thomas Richard	I.E.-Feb.'50	Audobon, N.J.
Brey, Gerald Morris		Emmaus
Brion, Dalton Franklin	M.E.-Feb.'50	Williamsport
Brong, Harold William	Bus.-Feb.'50	Bethlehem
Brothers, John Theodore	Arts-June'50	Ware Neck, Va.
*Broughal, James Lee		Bethlehem
Brown, David Osmond	Ch.E.-June'49	Hastings, N.Y.
Brown, Eugene Emery	Bus.-June'49	Chatham, N.J.
*Brown, James Thomas		Chicago, Ill.
Brown, William Morris, Jr.	Bus.-June'50	Bethlehem
Brownback, John Kenneth, Jr.	Arts-June'49	Bethlehem
Bruder, Norman Gilbert	M.E.-June'51	Emmaus
Brummitt, Wallace Brooks	Arts-June'49	Havelock, N. C.
Brunner, Robert Fretz	M.E.-June'51	Pipersville
Buck, Richard William	M.E.-June'49	Bethlehem
*Buckley, Katharyn Rau		Springtown
Buckwalter, Robert Clayton	C.E.-Oct.'48	Lancaster
Buehler, Seymour Jack	Bus.-June'50	Brooklyn, N.Y.
†Buhl, John Edward	C.E.-June'51	Plainfield, N.J.
Burton, Franklin Louis	M.E.-Feb.'51	Fallsington
Butler, John William	E.E.-June'50	Belvidere, N.J.
Byrnes, Thomas Francis, Jr.	Bus.-Feb.'51	Hartford, Conn.

Calvert, John William	Arts-Feb.'50	Williamsport
Cameron, Donald Robert	Bus.-Feb.'51	Chatham, N.J.
Cameron, Edward Duncan	Bus.-June'49	Allentown
Campbell, Douglas Young	Bus.-Oct.'48	Rutherford, N.J.
Campbell, Robert James	I.E.-Feb.'49	Bethlehem
Carroll, Graham Michael	I.E.-Feb.'51	Atlantic City, N.J.
†Carson, Robert Charles	E.M.-June'51	Bethlehem
Case, James Patrick	Bus.-Feb.'50	Bethlehem
*Casciano, Mary Lillian		Bethlehem
Cassano, Joseph Frederick	E.E.-June'50	Bethlehem
Castner, Daniel Ellingwood	Bus.-June'51	Succasonna, N.J.
Chalupa, Martin	M.E.-June'51	Lansford
Chapman, Roland Chester	Bus.-June'49	Santa Barbara, Calif.
Chase, Robert Clifford	Ch.E.-June'51	Hackensack, N.J.
Cheesman, Thomas Peter		Hellertown
Cheetham, Rodger P.	E.E.-Feb.'51	Philadelphia
Childs, Frank Lawton, Jr.	Bus.-June'51	Brookside, N.J.
Chiles, Franklin Joseph	C.E.-June'49	Bethlehem
Chovanes, Eugene	M.E.-June'50	Hazleton
Christ, Robert Bruce	Arts-June'50	Allentown
Christiansen, Theodore Waldemar	Ch.E.-June'51	Brooklyn, N.Y.
Christie, James Matthews	Bus.-Oct.'48	Radburn, N.J.
Christie, Norman Bennett	M.E.-Oct.'48	New York, N.Y.

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*Summer Session.
†Summer Engineering Courses.

Christman, William Schirmer	I.E.-Feb.'50	North Wales
Chubb, Ralph	M.E.-Feb.'50	Bethlehem
*Chubbuck, Dorothy Harriet		Bethlehem
*Chubbuck, Margaret Mary		Bethlehem
Clare, Leslie Paul	Met.E.-June'50	Allentown
Cliff, Thomas Edward	Arts-Feb.'49	Coopersburg
Coeyman, Robert Muir	Bus.-Oct.'48	Newark, N.J.
Collmann, Spencer Howe	Arts-June'49	Wilkes-Barre
Colmer, Robert Henry	M.E.-Feb.'50	Bethlehem
*Colver, Marian Ruth		Bethlehem
*Compton, Mabel		Bethlehem
Congdon, Raymond	Bus.-June'49	Glen Ridge, N.J.
Conklin, Richard Jessop	M.E.-June'51	Bernardsville, N.J.
Conover, Charles Milton	I.E.-Oct.'48	Palmyra, N.J.
*Conway, Lorraine Elizabeth		Quakertown
Cope, Charles Kenneth		Bethlehem
Corriston, Winfield Ferguson	M.E.-June'49	Bethlehem
Corson, James Allan	M.E.-June'51	South Orange, N.J.
Cosgrove, John Casey	M.E.-June'51	Pittsburgh
†Cousins, Robert Henry	C.E.-June'51	Nutley, N.J.
Cowin, Paul Frederick	Bus.-Feb.'49	Bethlehem
*Crafton, Clementine Ann		Bethlehem
Cram, Michael John	Ch.E.-Feb.'51	Atlanta, Ga.
Crehore, William Williams III	M.E.-Feb.'51	Syosset, N.Y.
Cressman, Mark Edgar	Bus.-Feb.'49	Allentown
Cristy, Albert Bowman	M.E.-June'50	Honolulu, T.H.
†Cummins, Frank Michael	C.E.-June'51	Pompton Lakes, N.J.
Cunningham, Robert Thomas	Bus.-June'50	Whitestone, N.Y.
Curtis, Dorothy Judd		Bethlehem
Cusick, John Henry	I.E.-June'50	Glen Ridge, N.J.
*Daeufer, Mary W.		Allentown
Damico, Frank Albert		Reading
Danner, Wilson Elmer		Easton
D'Antonio, Mario Raphael	Arts-June'50	Trenton, N.J.
Davidheiser, Edward William	M.E.-June'51	Philadelphia
Davies, Robert William	Met.E.-June'51	Catasauqua
Davis, Harry Williams	Bus.-Feb.'49	Lehighton
Davis, Richard Cameron	M.E.-Feb.'49	Freeport, N.Y.
Davis, Thomas Edward	E.M.-June'49	Nanticoke
Dawley, Webster	M.E.-June'49	Plainfield, N.J.
Dawson, Clifford Henry	Bus.-Feb.'51	Chevy Chase, Md.
Day, Charles Burton	I.E.-June'51	Westwood, N.J.
Decker, Erwin Louis	M.E.-Feb.'49	Allentown
Deemer, Philip Ramsay, Jr.	M.E.-June'50	Bethlehem
*DeHaven, Richard Place		Mt. Pocono
DeMott, Alfred Eckman	M.E.-Feb.'49	Allentown
Denham, Daniel Eugene	Bus.-June'49	Stamford, Conn.
*Dent, Frederick G.		Allentown
*Derrico, Jacob P.		Bethlehem
Desnoyers, Paul Jacque	Ch.E.-June'51	North Plainfield, N.J.
Diacogiannis, Robert Nick	Bus.-June'49	Freemansburg
*Dickinson, Anna T.		Bethlehem

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*Summer Session.
†Summer Engineering Courses.

Diehl, Floyd William, Jr.	Arts-June'50	Hellertown
*Dimmick, Ethel Olga		Easton
Dimmick, Leonard Ray	Bus.-Feb.'50	Bethlehem
*Dimmick, Martha E.		Easton
Dinstel, Woodrow Lejune	E.M.-June'51	Irvington, N.J.
DiSpirito, Vincent J.	Bus.-June'49	Freeland
Ditterline, Roy Edwin, Jr.	M.E.-June'49	Bethlehem
Doney, Alfred Thomas	M.E.-June'51	Pen Argyl
Dorman, William Henry	E.P.-Feb.'50	Corning, N.Y.
Dorsey, William George, Jr.	M.E.-Feb.'50	Dover, N.J.
Downs, George William	I.E.-June'50	Bethlehem
Downs, Richard Elwood	Bus.-Feb.'49	Woodbury, N.J.
Drack, Robert John	Bus.-June'50	Teaneck, N.J.
Duffy, Robert Francis	M.E.-Oct.'48	New Rochelle, N.Y.
Dugan, Edward Joseph	I.E.-June'49	Bethlehem
†Dunbar, Douglas MacDonald	E.M.-Feb.'50	West Nyack, N.Y.
Dunn, Robert Thomas	E.P.-Oct.'48	Millburn, N.J.
Dutton, William Glenn	Bus.-June'51	Allentown
*Dwyer, Irene		Palmerton
†Dyer, Florence Helen		New York, N.Y.

*Ealey, Kathryn Mosbach		Pen Argyl
Eisenhard, Wilmer Carl	Chem.-Oct.'48	Allentown
Eisenhauer, Harold Albert	I.E.-June'50	Bethlehem
Eldridge, Elwood Clark	M.E.-June'51	Wenonah, N.J.
Eliezer, David Frank	Arts-June'49	Paterson, N.J.
Elm, Gerhard William	Bus.-Feb.'50	Palmerton
Ely, Clyde Sayre	Bus.-Oct.'48	Morristown, N.J.
Engelhardt, Theodore Charles, Jr.	Bus.-June'49	Wyomissing
Enright, John James Gilligan	Arts-Oct.'48	Bethlehem
Enterline, Robert Rhoades	M.E.-Feb.'50	Ashland
Erdle, Louis Vincent	M.E.-June'50	Bethlehem
†Erdman, George Emery	E.M.-Feb.'51	Shamokin
Ernst, Edwin Paul	Bus.-Feb.'49	Philadelphia
Eshbach, Russell Elwood	M.E.-June'49	Reading
*Esser, Paul Biery, Jr.		Allentown
Essig, Harold George	Arts-Feb.'51	Merrick, N.Y.
Eu, Alexander Keng-Kee	I.E.-Feb.'50	Secaucus, N.J.
Evans, Malcolm Bruce	Bus.-June'50	Bethlehem
Evans, Paul Robert	Bus.-Feb.'49	West Catasauqua
Evans, William Charles	Ch.E.-June'51	Ventnor, N.J.
Everly, Robert Spencer	I.E.-Oct.'48	Scranton
Evon, Joseph	E.E.-June'49	Scranton

*Fabian, Amy Elizabeth		Revere
Fabian, John Steven	Bus.-Oct.'48	Palmerton
*Fangboner, Ada		Easton
Faust, Albert Charles	E.E.-June'49	Bethlehem
Faust, Raymond Earl	Arts-June'50	Bethlehem
Fegely, Franklin John	Bus.-June'50	Allentown
Fegley, Paul Gerald, Jr.	E.E.-June'50	Orwigsburg
Fehnel, Richard Walter	M.E.-June'51	Bethlehem
Feinberg, Stanley	Bus.-Oct.'48	Dover, N.J.

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*Summer Session.
†Summer Engineering Courses.

Ferguson, Paul Bruce	I.E.-June'49	Philadelphia
Ferguson, Robert Pool	I.E.-Oct.'48	Westfield, Mass.
Fetterolf, Peter August	E.E.-Oct.'48	Ashland
Fichter, Frank Charles	E.E.-Feb.'50	Bethlehem
Fiedler, Edward	C.E.-Feb.'51	Allentown
*Fielding, Eileen Carolyn		Bethlehem
Filaseta, Pasquale Joseph	E.E.-Feb.'51	Bethlehem
*Finkbeiner, Margaret C.		Bangor
Fisher, James Robert	M.E.-Feb.'49	Williamsport
Fiske, Richard Lewis	M.E.-June'51	Palmerton
Fleagle, George Paul	Arts-June'51	Bethlehem
Fleckenstein, William Owen	E.E.-Feb.'50	Moscow
Flecksteiner, John William	Ch.E.-Feb.'50	Bethlehem
Fleischer, Carl William	E.P.-June'50	North Bellmore, N.Y.
Flores, Richard Winthrop	Ch.E.-Feb.'50	Upper Darby
Flower, Franklin Bromley	I.E.-Oct.'48	Bayville, N.Y.
Foltz, William Andrew	M.E.-Feb.'50	Easton
Forsythe, Marvin Perry	I.E.-Feb.'49	Kenvil, N.J.
Foster, Charles Arthur, Jr.	Arts-June'50	Philadelphia
†Foster, John Carroll	E.M.-June'51	Easton
Foster, Theodore II	Bus.-Feb.'50	Utica, N.Y.
Foust, John Haring	Ch.E.-June'49	Wilkes-Barre
Frager, Victor Irving	Bus.-Feb.'49	Newburgh, N.Y.
*Frankenfield, Lucy B.		Hellertown
*Frankenfield, Pearl Mae		Bethlehem
Frantz, Robert Martin	M.E.-June'51	Waynesboro
Freeh, John Joseph	E.E.-June'51	Pleasant Valley
Frey, Philip Wayne	C.E.-Feb.'52	Short Hills, N.J.
Frischkorn, Frank Jennings	M.E.-Feb.'49	Detroit, Mich.
Fritchman, Edward Reeve	Arts-June'49	New York, N.Y.
*Fritz, Bernard J.		Bethlehem
Fritz, Ralph Canfield	Ch.E.-June'49	Norristown
Fryberger, Charles Theodore	I.E.-June'51	Philadelphia
Fuller, Robert Merrill	Bus.-Feb.'50	Hellertown

Gabel, Austin	Arts-June'49	Orange, N.J.
Gackenbach, Russell E.	Met.E.-June'50	Allentown
†Galow, George Emerson	Arts-Feb.'49	Mt. Carmel
Gandolfi, Gino Albert	M.E.-June'49	Folsom, N.J.
Ganter, George Edwin	Ch.E.-June'51	Staten Island, N.Y.
Garthwaite, David Sawyer	I.E.-June'51	Rahway, N.J.
Gaver, Robert Bernard	I.E.-Oct.'48	Buffalo, N.Y.
Gebhardt, Neil Humphrey	I.E.-June'49	Erie
*Gehring, Charles Henry, Jr.		Bath
Geoly, Charles	M.E.-June'50	Flushing, N.Y.
Georgiadis, John Franklin	Met.E.-June'50	Bethlehem
Geosits, Frank Julius	C.E.-June'50	Northampton
Geraci, Frederic Entress	Bus.-June'51	Dobbs Ferry, N.Y
Gerrard, Jack Walker	M.E.-June'51	Blasdell, N.Y.
Gerstenberger, Henry Leigh, Jr.	I.E.-Feb.'51	Roselle, N.J.
Geyer, John Henry	Met.E.-Feb.'50	Philadelphia
Gibb, John	E.E.-June'51	Elizabeth, N.J.
Gibbons, John Patrick	Bus.-June'49	Bethlehem

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*Summer Session.
†Summer Engineering Courses.

Gilchrist, Claire		Bethlehem
Giles, William Francis	M.E.-June'49	Bethlehem
Gilley, Joseph Frederick III	Met.E.-Feb.'50	Bethlehem
Gillinder, Joseph Fletcher	Bus.-June'49	Port Jervis, N.Y.
Gilpin, Ernest Grant	Arts-June'49	Paradise
Glessner, John Franklin		Bethlehem
Goeller, Robert Arthur, Jr.	Bus.-Feb.'50	Scarsdale, N.Y.
†Goeppert, Albert Richard	E.M.-June'49	Freeland
Goodhart, Jay Hughes	Bus.-Feb.'50	Irwin
Gorcsan, John, Jr.	M.E.-June'49	Bethlehem
Gordon, Arthur Thomas	E.E.-June'50	Coopersburg
Gostonyi, Julius Richard	I.E.-Oct.'48	Bethlehem
Gotwalt, Robert Henry	Bus.-June'50	Bethlehem
Gozzard, Robert	Bus.-Feb.'51	Hellertown
*Graber, Alvenia Schultz		East Greenville
Graham, John Harry	E.E.-Feb.'50	Lansdale
Graham, John Woods	Bus.-June'50	Philadelphia
Green, Daniel Joseph	Bus.-Oct.'48	Allentown
Green, Henry Holmes	I.E.-June'51	Hazleton
Greenamoyer, William John	Bus.-Feb.'49	Bethlehem
†Grell, Harry William, Jr.	M.E.-Feb.'49	Brooklyn, N.Y.
Griffin, David Hancock	Bus.-June'50	Bronxville, N.Y.
*Grim, Bessie May		Shelly
Grim, Harold Ray	Ch.E.-Feb.'50	Red Lion
Grosskettler, John Joseph	M.E.-June'51	Hazleton
Gruber, Barbara Elaine		Palmerton
Gutekunst, Raymond James		Allentown
Haas, Eugene, Jr.	G.C.D.	Allentown
Haberstroh, John Joseph	Bus.-Feb.'51	Altoona
Hagey, Charles Donald	Arts-Feb.'49	Bethlehem
Hall, Edwin Francis, Jr.	E.E.-June'49	Westfield, N.J.
Hall, Penelope		Bethlehem
Halpern, Stephen	Arts-Feb.'51	Brooklyn, N.Y.
Haltenhoff, Charles Edwin	C.E.-June'51	Brooklyn, N.Y.
*Haney, Mae S.		Coopersburg
Hankinson, Kenneth	Bus.-June'50	Pennington, N.J.
Hannan, Robert Munroe	I.E.-Feb.'51	Hackensack, N.J.
Hantz, Benjamin Franklin, Jr.	I.E.-June'49	York
Hanway, Paul Scott, Jr.	Bus.-Feb.'51	Ridgefield Park, N.J.
Harman, Henry Martyn, Jr.	Bus.-Feb.'50	Narbert
Harris, Charles Augustus, Jr.	Bus.-June'49	Harrisburg
Harris, Christopher John	Ch.E.-Feb.'51	Nutley, N.J.
†Harris, Stuart Innes	E.M.-Feb.'51	Katona, N.Y.
†Hartman, Ralph Leroy, Jr.	C.E.-June'51	Fair Lawn, N.J.
Hartshorne, Frank Allen	E.E.-Oct.'48	Glenside
Hastey, Kenneth Warren	Ch.E.-June'49	East Rutherford, N.J.
Hattal, Howard Edward	E.E.-Feb.'50	Norristown
Hauze, William John, Jr.	E.E.-June'50	Bethlehem
Head, John James	I.E.-June'49	West Lawn
Heavener, Arthur Augustus	M.E.-June'50	Easton
*Hegedus, Elaine Reichart		Brooklyn, N.Y.
Hegedus, John	Bus.-Oct.'48	Bethlehem

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*Summer Session.
†Summer Engineering Courses.

Heine, Theodore David	M.E.-June'51	Lehighton
*Held, Jean Ackley		Allentown
*Helm, Helen Conrad		Easton
Hendrick, Robert Reeve	I.E.-June'49	East Orange, N.J.
Henrich, Harold John	I.E.-Feb.'50	Hempstead, N.Y.
*Henry, Margaret Black		Summit Hill
Henschel, John, Jr.	Bus.-Feb.'51	Garden City, N.Y.
Herczeg, Louis Stephen	E.P.-June'49	McAdoo
Herring, Francis Girard	Ch.E.-June'49	Allentown
Hershey, John Raymond, Jr.	Bus.-Feb.'49	Hagerstown, Md.
Hetzel, George	I.E.-June'51	Pittsburgh
Hewit, Frank Goodfellow	Bus.-Feb.'49	Plainfield, N.J.
Hewit, Oliver Hartley III	Bus.-Feb.'49	Plainfield, N.J.
Heyman, Sidney Solomon	M.E.-Feb.'50	Woodmere, N.Y.
Heyworth, Emerson Ormerod, Jr.	Bus.-June'49	Mamaroneck, N.Y.
*Hibbard, Anne Fowler		Hellertown
Higginson, Edgar Albert	I.E.-Feb.'50	North Bergen, N.J.
*Hine, Dorothy Smiley		Quakertown
Hinst, William Whittendale	E.E.-June'49	Orange, N.J.
*Hoch, Christine Mary Ann		Allentown
Hoch, Edward Vincent	Arts-June'50	Bethlehem
Hoch, Richard Clark	Chem.-June'50	Nazareth
Hoffman, Donald Bernard	M.E.-Feb.'49	Allentown
Hoffner, John Richard	M.E.-June'51	Bethlehem
Hoffstetter, Curtis Francis	M.E.-June'50	Allentown
Hogan, Edmund Ross, Jr.	M.E.-June'50	Easton
Hohl, John Stewart	I.E.-Feb.'49	Allentown
Holmes, Stanley Taylor, Jr.	Bus.-Oct.'48	Trenton, N.J.
Holtvedt, James Armstrong	C.E.-June'51	Wilton, Conn.
Hontz, Mark Robert	E.E.-Oct.'48	Lehighton
Hoover, Herbert Christopher, Jr.	I.E.-June'51	Havertown
Hoover, Herbert Leslie	E.P.-June'51	Montoursville
*Horne, Carrie H.		Coopersburg
Horneck, George B.	Arts-June'49	Baldwin, N.Y.
Horvath, Michael Joseph	Arts-June'51	Northampton
Housley, John Gamaliel	E.E.-June'51	Elkins Park
Houston, Jack Spalding	Arts-June'50	Allentown
Howard, Raymond Theodore	Bus.-June'49	Ossining, N.Y.
Howell, Elizabeth Anne		Bethlehem
†Howells, Lewis William, Jr.	E.M.-June'51	Orefield
Hower, Meade Martin	E.P.-Feb.'49	Danielsville
Howse, Philip Chase	Bus.-Feb.'51	Exton
Hoyt, Leon Glover, Jr.	I.E.-Feb.'50	Summit, N.J.
Hoza, Martin David	M.E.-June'51	Cortland, O.
Huber, Irvin Lefever	C.E.-Oct.'48	Neffsville
*Huber, Josephine Jacoby		Bethlehem
Huber, William Charles	Bus.-June'49	Egypt
Hughes, Robert Edward	Chem.-June'49	Jackson Heights, N.Y.
Hunt, William James	Arts-June'50	Jackson Heights, N.Y.
Hurd, William Allen	M.E.-June'50	Newburgh, N.Y.
Husovsky, George Richard	Bus.-June'49	Bethlehem
Iobst, Edgar Henry, Jr.	Chem.-June'50	Emmaus

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*Summer Session.
†Summer Engineering Courses.

Irwin, Richard Webb, Jr.	M.E.-June'51	Pittsburgh
Isaac, Anthony John	C.E.-Feb.'50	Bethlehem
*Jackson, Allen Herbert		Pen Argyl
†Jackson, Daniel Wyer	C.E.-June'50	Cambridge, Mass.
Jackson, Eugene Alexis	Arts-June'51	Norwalk, Conn.
†Jacobs, Robert Joseph	C.E.-June'51	Akron, Ohio
Jacobsen, Jerome Gill, Jr.	E.P.-June'49	Towson, Md.
Jelly, Irving Augustus, Jr.	M.E.-Feb.'49	Palmerton
†Jennings, Arthur Snyder	C.E.-June'50	Morton
Jensen, Grace Elizabeth		Bethlehem
Jewell, Clarence John, Jr.	Bus.-Oct.'48	Bethlehem
*Johnson, Charles William		Pennsburg
Johnson, Richard Edward	Ch.E.-June'49	Philadelphia
Johnson, Wesley Alan	M.E.-June'51	Bethesda, Md.
Kaercher, Charles Albert	I.E.-June'50	Bethlehem
Kaltenthaler, John Head	M.E.-June'51	Wynnewood
Kaszyski, William Michael	Bus.-June'50	Northampton
Katris, William John	G.C.D.	Bethlehem
Kaufman, Jerome Williard	Met.E.-June'49	Philadelphia
Kaup, Edgar George	Chem.-June'49	Glen Ridge, N.J.
Kavalkovich, William Michael	M.E.-Oct.'48	Allentown
Keefe, Robert Mark	I.E.-June'51	Mt. Vernon, N.Y.
Keel, Thomas Herbert	M.E.-June'51	Forest Hills, N.Y.
Kehrli, Henry Stewart	M.E.-June'50	Dunmore
*Keller, Priscilla Clay		Quakertown
Kendig, Robert Missley	M.E.-Feb.'50	Salunga
Kephart, Doyle Marvin	Bus.-June'49	Bethlehem
Keppel, Russell Newell	Bus.-June'50	Cranford, N.J.
Kercimar, Francis Charles	G.C.D.	Allentown
Kerr, Mary Craig		Pasadena, Calif.
Kershner, Charles Lyon	M.E.-June'50	Reading
*Kilpatrick, Raymond Guy		Bethlehem
Kimminour, Rodney F.	I.E.-Feb.'50	Bethlehem
*Kindt, Hilda Frederick		Walnutport
†King, Russell Gold, Jr.	C.E.-June'51	Allentown
Kircher, George Joseph	I.E.-Feb.'49	Brooklyn, N.Y.
Kirchman, Audree Helen		Bethlehem
Kitson, Harold, Jr.	E.E.-June'50	Glenside
Klein, David Aylwin	Ch.E.-Feb.'50	Easton
Kleinwaks, Eugene	I.E.-Feb.'49	Newark, N.J.
Kline, Harold Emmett	Met.E.-'Feb.'50	Harrisburg
Klos, James Henry	Bus.-Feb.'50	Jenkintown
†Klucher, Robert Hugh	C.E.-June'50	Hershey
Knauf, William George	M.E.-June'51	La Mott
†Knecht, Norton Mark	E.M.-June'51	Allentown
Knight, Calvert Gentry	C.E.-Feb.'50	Philadelphia
Knipe, Wilbert Roy	Arts-June'50	Bethlehem
†Knouse, Albert Bauer	C.E.-June'51	Glenside
Knowles, Mary Caroline		Bethlehem
Koch, Arthur Jacob, Jr.	M.E.-Oct.'48	Scranton
Kotanchik, John Joseph	Bus.-Feb.'50	Shamokin

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*Summer Session.

†Summer Engineering Courses.

*Kovacs, Frank Steve		Woodstock, Va.
Kovaka, George Alexander	I.E.-Feb.'49	Bethlehem
Kowolaski, Joseph David	M.E.-Feb.'50	Bethlehem
†Kraemer, Ralph Louis	C.E.-June'51	Scranton
Kramer, Joseph Ernest	M.E.-Feb.'49	Perkasie
Kress, Howard Alfred	M.E.-Feb.'49	Allentown
Krieg, Louis Ernest, Jr.	I.E.-June'50	Allentown
Kroll, Edward Emil	Bus.-Feb.'50	Passaic, N.J.
Kucsan, Stephen	E.P.-Oct.'48	Bethlehem
Kuentz, Oscar Craig	M.E.-June'50	Plainfield, N.J.
Kummer, Katherine		Palmerton
Kunsman, Eugene Erwin	I.E.-Feb.'49	Bethlehem
Kuntzleman, Harry Charles	E.E.-June'49	Pottstown

Laird, Allan, Jr.	E.E.-Feb.'49	Avoca
Lambert, Earl Jay	Bus.-Oct.'48	Nazareth
Landau, William Morris	Bus.-Oct.'48	Mt. Vernon, N.Y.
Lange, Louis, Jr.	C.E.-Feb.'51	Brooklyn, N.Y.
Laubach, Ward Eldon	E.E.-June'49	Easton
Laughlin, William Stuart, Jr.	M.E.-June'51	Latrobe
Laury, John Theodore	Arts-June'52	Bethlehem
Lavine, Harris	Arts-Feb.'50	Trenton, N.J.
Lavine, Richard Ellis	Bus.-June'49	Trenton, N.J.
Leach, George Harold	E.E.-June'49	Englewood, N.J.
*Leary, Jane Kiefer		Easton
Lee, Thomas Carleton	Arts-Oct.'48	Niagara Falls, N.Y.
*Leftwich, Clement Shorter		Bethlehem
Leming, John Walter, Jr.	I.E.-June'49	Midland
Lenhart, James Herbert	E.E.-June'49	Allentown
Lenney, Ronald J.	Bus.-June'49	New York, N.Y.
Lentz, Frederick Robert	I.E.-Oct.'48	Allentown
*Leonard, Fred William		Easton
Leopold, Jack Kern	M.E.-June'51	Nazareth
Lerch, Archie Lauren	Bus.-Feb.'49	Rochester, N.Y.
Le Roy, Milton Joseph, Jr.	M.E.-June'50	Ashtabula, Ohio
Leunis, William George	Bus.-June'49	Bethlehem
Levan, Richard Harold	M.E.-June'51	Fleetwood
Lewis, Thomas Edward	Arts-Oct.'48	Pocono Pines
Li, Chen-Chia	Met.E.-Feb.'49	New York, N.Y.
Lichtman, Robert William	Arts-June'49	South Orange, N.J.
*Lilly, Helen Mary		Bethlehem
Limons, Robert Anthony	Arts-June'50	Bethlehem
Lindholm, Arne Carlson	Bus.-Feb.'50	West Englewood, N.J.
Lins, Richard Warg	Bus.-June'49	Bethlehem
Loehmann, Fred George	I.E.-Feb.'49	Waterbury, Conn.
Loewenwarter, Paul Louis	Bus.-June'50	Brooklyn, N.Y.
*Lohman, Ruth June		Bethlehem
Lohman, Thomas Henry	Bus.-Feb.'49	Steelton
Lohrmann, Robert John	Bus.-June'49	West Orange, N.J.
Long, Marjorie Ann		Allentown
Long, Robert Charles	Ch.E.-June'49	West Lawn
Long, William James	Bus.-Feb.'49	Bethlehem
Longenberger, Fred Hartman	E.E.-June'51	Bethlehem

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*Summer Session.
†Summer Engineering Courses.

†Lore, Franklin Jerrell	C.E.-June'51	Bridgeton, N.J.
Loux, Henry Arthur	Bus.-Feb.'52	Chatham, N.J.
Love, Donald Norton	Bus.-Feb.'49	Bethlehem
Lovington, Ross Clement	M.E.-Oct.'48	Bloomfield, N.J.
Luch, Myron Jacob, Jr.	I.E.-June'49	Bethlehem
Lyman, David Cass	M.E.-June'51	Upper Montclair, N.J.
Lympany, Byron Barney	Chem.-Feb.'50	Wilkes-Barre
Lynch, Henry Merrill, Jr.	I.E.-Feb.'50	Wilmington, Del.
Lyons, John Thomas	Bus.-June'51	Corning, N.Y.
Maack, Herbert Raymond	Bus.-June'50	Pottstown
Macatician, John	Arts-June'51	Coaldale
MacGregor, Louis Morgan		Allentown
MacLaughlin, John Robert	Bus.-June'49	Bethlehem
Maco, Paul Stephen	Bus.-Feb.'50	Bethlehem
Macri, Samuel Joseph	Arts-June'50	Hellertown
Magee, Curtis Weston	Bus.-Oct.'48	Pittsburgh
Magula, Anthony William		Coaldale
Mahoney, John Francis, Jr.	M.E.-June'51	Merrick, N.Y.
*Mahoney, Mary Grace		Bethlehem
†Malanaphy, Richard Hugh	C.E.-June'51	Flemington, N.J.
Maleson, Paul	M.E.-June'49	Philadelphia
†Mandel, George William	E.M.-June'50	Catasauqua
Mankin, Harry Augustus, Jr.	M.E.-June'51	Philadelphia
Maragakes, Christopher	I.E.-Feb.'49	Astoria, N.Y.
Marcks, Charles Oliver	Bus.-Feb.'49	Bethlehem
Margerison, Albert Earl, Jr.	E.E.-June'50	Elkins Park
Margiotti, Vincent John	Arts-Feb.'50	Newburgh, N.Y.
Markle, James Edward	E.E.-Oct.'48	Hanover
Marsden, Edward Charles	Arts-Feb.'52	West Hartford, Conn.
Martin, Andrew Ross	Bus.-Feb.'49	Spring Lake, N.J.
Martin, Eric Charles	Bus.-Feb.'51	Staten Island, N.Y.
Martin, George Lawrence	M.E.-Oct.'48	Brooklyn, N.Y.
Martin, Maurice Theodore	I.E.-Oct.'48	Chevy Chase, Md.
Masteller, Charles, Jr.	C.E.-June'49	Bethlehem
Matthes, Andrew Merrill	I.E.-Feb.'50	Cleveland, Ohio
Matthes, William Leo, Jr.	E.E.-June'49	Manheim, W.Va.
Mattison, Keith, Wickham	M.E.-June'49	Port Allegheny
Maurer, Anthony Oliphint	C.E.-June'50	Rockville Centre, N.Y.
*Mauser, Bessie K.		Bethlehem
Mayer, Wallace Roy	Bus.-Oct.'48	Garden City, N.Y.
Mayer, Warren Herbert	Bus.-Feb.'49	Rockville Centre, N.Y.
McCabe, Ralph William	M.E.-Oct.'48	Bound Brook, N.J.
McCarty, Kenneth Peter	Ch.E.-June'49	Milford
McCauley, Wilbert Murdock, Jr.	E.E.-June'50	Greensburg
*McDowell, Elsie Mae		Bethlehem
McGrath, Henry Lockwood, Jr.	Bus.-Oct.'48	Damascus, Syria
McGuire, Andrew Edward	C.E.-Feb.'50	West Pittston
McHugh, Richard Nevin	Bus.-June'49	Trenton, N.J.
McInerney, William T.	Bus.-June'49	Midland
McKean, Alexander Huyette, Jr.	E.E.-Oct.'48	Pittsburgh
McKnight, Andrew Norton	M.E.-June'50	Quakertown
McRaven, Pilgrim Walker	I.E.-Feb.'49	Bethlehem

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*Summer Session.
†Summer Engineering Courses.

McWilliam, John Jeffrey	Bus.-June'49	Rockville Centre, N.Y.
Mellen, Raymond Ralph	Arts-Feb.'49	Maplewood, N.J.
Mendler, Robert Fairchild	I.E.-Feb.'50	Bethlehem
Mengle, Lewis Irwin	E.E.-Oct.'48	Allentown
Mertz, John Mercer, Jr.	M.E.-June'51	Wilmington, Del.
Mertz, William Richard	M.E.-June'49	Pittsburgh
*Mervine, Harry Umlauf		Pen Argyl
Merwin, Frederick Walter	M.E.-Oct.'48	Mt. Pocono
Metcalf, Albert Trover, Jr.	E.E.-June'50	Bethlehem
†Meyer, George Frederick, Jr.	E.M.-Feb.'50	Maplewood, N.J.
Meyer, Robert Dean	E.E.-June'50	Trenton, N.J.
Meyerhoff, Harry Charles	I.E.-June'49	Baltimore, Md.
Meyers, Richard Irving	I.E.-Feb.'49	Manasquan, N.J.
*Michael, Charles Preston		Allentown
Michie, Andrew Young III	Bus.-Feb.'50	New Britain
Mierzwinski, Edmund Marjan	E.E.-Feb.'50	Waterbury, Conn.
Miles, Rowland	Ch.E.-Oct.'48	Northport, N.Y.
Miles, Theodore Joseph		Catasauqua
Miller, Edgar Hanmer	I.E.-June'49	East Orange, N.J.
†Miller, Emory Wells	E.M.-June'51	Passaic, N.J.
Miller, John Galt	I.E.-June'51	Milwaukee, Wis.
Miller, Joseph Ambrose	Arts-Feb.'49	Allentown
Miller, Karl Gritz	Bus.-Feb.'49	Allentown
Miller, Richard Charles	M.E.-Feb.'51	Bethlehem
Miller, Theodore Alexander	I.E.-June'51	Scranton
Millet, Marcel Fernand	Bus.-Feb.'50	Wyomissing
Minde, Theodore Arthur	Arts-Feb.'51	Summit, N.J.
†Mink, Frank Allen, Jr.	C.E.-June'51	Kennett Square
Mirenna, Louis	Bus.-Feb.'50	Phillipsburg, N.J.
Mitchell, John D.	I.E.-Feb.'49	Bridgeton, N.J.
†Mitchell, Steve	E.M.-June'51	Trenton, N.J.
Mitman, Stewart Phipard	Bus.-June'49	Huntington, N.Y.
Mittal, Edward George	I.E.-June'50	Bethlehem
Mock, Walter Willis, Jr.	I.E.-June'50	Rutherford, N.J.
Mohr, Frederick Schaefer	E.E.-June'51	Ardmore
Moodie, Stanley Thompson	Bus.-June'49	Grove City
Moore, Eugene Willard, Jr.	I.E.-Feb.'51	Pittsburgh
Moore, Robert Franklin, Jr.	E.E.-June'51	Maplewood, N.J.
Morgan, Ronald Brandt	Bus.-June'50	Morrisville
Morris, David Henry	Bus.-Oct.'48	Allentown
Moyer, Frank William	C.E.-Oct.'48	Allentown
Moyer, Philip Franklin	C.E.-Feb.'49	Doylestown
Moyer, Stanley William	Bus.-June'50	Emmaus
Muffley, Robert Thomas	Bus.-Feb.'50	Allentown
Muller, Paul William	M.E.-Feb.'52	Princeton, N.J.
Murphy, William Henry, Jr.	Bus.-June'50	Westfield, N.J.
Murray, Frank Joseph, Jr.	M.E.-June'51	Montclair, N.J.
Myers, Clyde Francis	Bus.-Feb.'50	Hanover
Myers, Harry Edward	E.E.-June'49	Collingdale
Nash, Claude Walter	E.P.-June'50	New York, N.Y.
Nelson, Russell Charles	Met.E.-Oct.'48	Bogata, N.J.
Nepon, Gerald Denis	I.E.-Feb.'51	Newark, N.J.

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*Summer Session.
†Summer Engineering Courses.

Newhard, Fred Jerome, Jr.	Ch.E.-Feb.'50	Allentown
Nichols, Robert Allen	Ch.E.-Oct.'48	Elmira, N.Y.
Nichols, William Ayres	Bus.-June'49	Westfield, N.J.
†Nicholson, Charles Alfred	C.E.-June'50	Williamsport
†Nolan, Robert Emmett, Jr.	E.M.-June'51	Scranton
Nordenholt, George Claus	M.E.-June'50	Bethlehem
Nothstein, Louis Israel	M.E.-Feb.'51	Mauch Chunk
Numbers, Robert Warren	C.E.-June'50	Allentown
Nylin, Robert Eugene	Bus.-Feb.'49	Rockville Centre, N.Y.

Oberholzer, Mary Gertrude		Easton
O'Brien, Duncan Thomas	Bus.-June'50	New York, N.Y.
O'Connor, James Patrick, Jr.	Bus.-Oct.'48	Berkley, Mich.
Ogle, Edward Arthur, Jr.	Bus.-Feb.'51	Hewlett, N.Y.
Oldach, Hugh Graham	M.E.-June'50	Philadelphia
Oldroyd, Donald Middlebrook	Bus.-June'49	Ridgewood, N.J.
Olsen, George Capewell		Corpus Christi, Tex.
Olstad, Martin Day	E.P.-June'51	Port Washington, N.Y.
Orlemann, Robert Duff	Bus.-June'51	Jenkintown
Overmeyer, James	E.P.-June'49	Columbia

Palasky, Ervin Carl	E.E.-June'51	Trenton, N.J.
Panasuik, Fred, Jr.	E.E.-June'50	Hellertown
Pappas, Peter James	Bus.-June'50	Elizabeth, N.J.
Paragone, Albert Peter	Bus.-Feb.'51	St. Albans, N.Y.
Pariseau, Joseph Henri, Jr.	M.E.-June'51	Bloomfield, N.J.
Parker, Reginald Schlegel	Arts-Feb.'50	Hellertown
Paroby, Walter	M.E.-Oct.'48	Taylor
Parsons, Edward Dippolt, Jr.	M.E.-June'51	Trenton, N.J.
*Pauff, George William		Hartsdale, N.Y.
*Paul, Betty Renée		Allentown
†Paul, Philip Richard	G.C.D.	Philadelphia
Peabody, John Marion	G.C.D.	Pittsburgh
*Pellettieri, Geraldine		Allentown
Pennauchi, Carl John	Bus.-Feb.'49	Burlington, N.J.
Perenyi, Andrew Charles	Ch.E.-June'49	New Brunswick, N.J.
Perkins, Enoch, Jr.	M.E.-Oct.'48	Bethlehem
Petersen, Jacob Edward	M.E.-Feb. 50	Braintree, Mass.
Petrone, John James	M.E.-June'49	Amsterdam, N.Y.
Pettit, Alfred Wells	Arts-Feb.'50	Caldwell, N.J.
Phillips, Joseph James	M.E.-Feb.'50	Mt. Carmel
Phillips, Lee Wolfe	Bus.-Feb.'49	Allentown
Phillips, Robert Lisle	I.E.-June'51	Manhasset, N.Y.
*Phillips, Sara		Easton
Pickens, Harley Lester	I.E.-June'50	Baldwin, N.Y.
Pierok, Walter Alexander	Bus.-June'49	Bethlehem
Pierson, James Harper Starr	Arts-June'51	Wilmington, Del.
Pilling, Herbert Burgess	Bus.-Oct.'48	Philadelphia
Polhemus, William DeWitt	Arts-June'49	Bethlehem
Polinak, Donald	I.E.-Feb.'50	Shamokin
Pope, Edward Macrae	Bus.-June'51	North Plainfield, N.J.
Popson, Andrew Thomas	Arts-Feb.'52	Freeland
Porter, William Wilson, Jr.	I.E.-June'49	East Orange, N.J.

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*Summer Session.
†Summer Engineering Courses.

Portz, Frederick Evans, Jr.	I.E.-June'49	Arlington, N.J.
Post, Donald Quentin	Bus.-June'50	Bloomfield, N.J.
Post, William Greer, Jr.	Bus.-Feb.'49	Bloomfield, N.J.
Postetter, David Edward, Jr.	E.E.-June'49	Reading
Potter, William Douglas	Bus.-Feb.'50	Brielle, N.J.
Potts, Phillip Edward	Ch.E.-Feb.'49	Quakertown
Powers, Benjamin William	Bus.-Oct.'48	West New York, N.J.
Pritulsky, Peter Paul	M.E.-June'50	Bethlehem
Prosswimmer, Paul Edmund, Jr.	M.E.-June'51	Great Neck, N.Y.

Rabenold, Anson Edwin	Bus.-Feb.'51	Allentown
Raffetto, Theodore John	Bus.-Feb.'50	Brooklyn, N.Y.
Rahmes, Gordon Roswell	Bus.-Feb.'49	Rutherford, N.J.
Raidline, Clifford Thomas	I.E.-June'49	Bethlehem
Ralph, Richard Arthur	Arts-Feb.'49	Summit, N.J.
Ramsey, Harry Bohlin	Arts-June'50	Wilmington, Del.
Raring, Frederick William	Met.E.-Feb.'49	Linglestown
Rauch, Freedel Alfred	Bus.-June'50	Orlando, Fla.
Read, Michael Dean	Ch.E.-Feb.'51	York
Ream, Robert Raymond	M.E.-Oct.'48	Ephrata
Reber, Ralph Richard	Bus.-June'49	Sellersville
Redcay, Grace Martine		Ephrata
Reed, Robert Bruce	Ch.E.-Feb.'50	Kintnersville
Reese, Willard Ambrose	I.E.-Feb.'49	Bethlehem
Rehrig, Allen Wilson	I.E.-June'49	Bethlehem
Reiff, Harry Elmer	Ch.E.-June'49	Allentown
Reitzel, Nicolas Martin	M.E.-June'50	Bethlehem
†Restrepo, Rodrigo Alvaro	C.E.-June'51	Washington, D.C.
Ricapito, Joseph Dominic John, Jr.	Arts-June'51	Bethlehem
†Richards, Elmer Arthur	C.E.-June'51	Somerville, N.J.
Richards, George Llewellyn	Arts-Oct.'48	Media
Rickner, Robert Howard	E.E.-Feb.'50	Roslyn
Rider, Edmund Samuel Richards	Met.E.-June'50	Euclid, Ohio
Rieker, Walter Charles	I.E.-Feb.'50	Bala-Cynwyd
†Rile, Thomas Henry	C.E.-June'49	Springfield
†Riley, Francis Stevenson	Arts-June'50	Bethlehem
Rinker, Robert Norton	E.E.-June'49	Nazareth
Rivers, Thomas Ellis, Jr.	Bus.-Oct.'48	Bronxville, N.Y.
Robel, Wayne Edward	C.E.-June'51	Johnstown
Roche, John Jacob	M.E.-Oct.'48	Reading
Roethke, Frederick Julius Henry	C.E.-June'49	Bethlehem
Rogers, Harold Goodman	E.E.-June'49	Reading
Rohn, Russell Albert	Bus.-Feb.'49	Easton
Rolle, Alan Paul	E.E.-Feb.'50	Philadelphia
Rometsch, Robert William	Bus.-Feb.'51	Philadelphia
Ronca, Concetta Jeanette		Bethlehem
Ronca, Pasquales Frederick	Bus.-Oct.'48	Bethlehem
Rondinella, Nicholas Joseph	M.E.-June'49	Wilkes-Barre
Roseman, Lawrence Joseph	M.E.-June'51	Lehighton
Ronemus, Morris Robert	M.E.-June'51	Harrisburg
Rosch, Francis Clifford, Jr.	M.E.-June'50	Devon, Conn.
Rospond, Robert Thaddeus	Met.E.-Oct.'48	Irvington, N.J.

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*Summer Session.
†Summer Engineering Courses.

*Roth, Charles Allen		Allentown
*Roth, Lulu Barbara		Gettysburg
*Roth, Mary Catherine		Allentown
Roth, Norman Harold	Met.E.-June'49	Allentown
Rotzell, Quintus Henry, Jr.	M.E.-June'50	Nazareth
Rowley, John William	I.E.-Oct.'48	Tonawanda, N.Y.
Rubel, Gordon Richardson	Met.E.-June'50	Great Neck, N.Y.
Rucki, Daniel Henry	E.E.-Feb.'50	Newark, N.J.
Rudolph, Burton George	E.E.-Feb.'50	Bethlehem
Rush, Harris Stockton	M.E.-June'50	Westfield, N.J.
*Ruth, Evelyn Velma		Hellertown
Rutherford, John B.	C.E.-June'49	Harrisburg

Sailor, Robert Allen	Ch.E.-June'51	Drexel Hill
Saltzman, Murray	Bus.-Feb.'50	Allentown
†Sammak, Douglas Michel	E.M.-Feb.'49	Elmira, N.Y.
Sanders, Robert Lewis	M.E.-Feb.'50	New Cumberland
Sansone, John William	Bus.-Oct.'48	Hawthorne, N.J.
Sasse, Ferdinand Charles	I.E.-June'49	Allentown
Savopoulos, Michael Demetrios	Met.E.-Oct.'48	Bethlehem
Scattene, Frank Anthony	M.E.-June'50	Bethlehem
*Schaadt, Woodrow Kenneth		Allentown
Schaefer, Joseph Bernard	Bus.-June'50	Quakertown
Schaeffer, Paul Richard	M.E.-Feb.'50	Halifax
*Schantz, Daniel Reese		Emmaus
Scheller, George Ernest	M.E.-Feb.'50	Hackettstown, N.J.
Schimmel, Thomas William	I.E.-Feb.'50	Bethlehem
Schissler, Melvin	Bus.-June'49	Quakertown
*Schlenker, Alma Hartman		Bethlehem
Schlichter, Ernest Stanley	E.E.-June'50	Allentown
Schmick, William George	E.E.-Feb.'50	Harrisburg
Schmitt, Paul Joseph	Ch.E.-June'49	Kingston
Schneider, Arnold Charles	M.E.-June'51	North Bergen, N.J.
Schneiders, Francis Anthony, Jr.	Ch.E.-Feb.'50	Plainfield, N.J.
Schoenberger, Morton Wayne	E.E.-June'49	Lehighton
Schrader, Walter Charles Alsop	Ch.E.-June'49	Garden City, N.Y.
Schrenk, Frank Henry	I.E.-June'51	Upper Darby
Schubert, Rudolph George	Chem.-Feb.'51	Easton
*Schuessler, Marjorie Louise		Easton
Schultz, Hyman Henry	Bus.-Feb.'49	Allentown
Schulz, Constance Elizabeth		Coopersburg
Schupsky, Harold John	M.E.-Feb.'49	Hokendauqua
Schwarz, Alfred Otto	M.E.-Feb.'50	Morris Plains, N.J.
Schwarz, Theodore George III	E.E.-June'49	Dunellen, N.J.
*Segel, Leah Mae		Allentown
Seifart, Curt	Bus.-Feb.'49	Charlotte, N.C.
Seifert, Rodman Harvey	Bus.-Feb.'51	Bethlehem
Seim, Norman John	Bus.-Feb.'51	South Orange, N.J.
Sell, Frederick Paul	Bus.-Feb.'49	Allentown
Sertl, Alfred Floyd	Bus.-June'49	Valley Stream, N.Y.
Sexton, Robert Wray	Bus.-Oct.'48	Maplewood, N.J.
Shaner, Benjamin Maurice	Bus.-Oct.'48	Bethlehem
Shealor, Robert Orton	Bus.-Oct.'48	Stamford, Conn.

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*Summer Session.
†Summer Engineering Courses.

Sherwood, Kenneth Wesley	Bus.-June'49	Englewood, N.J.
Shipley, Samuel Hunt, Jr.	M.E.-June'51	York
Shirey, Frank Ward	M.E.-Oct.'48	Clearfield
*Shumaker, Jane E.		Allentown
Sideris, Homer Geri	Arts-June'49	Bethlehem
*Simons, Doris Burk		Bethlehem
Smeloff, Richard Konstantin	I.E.-June'50	Allentown
Smith, Clyde Wilson	M.E.-Feb.'49	Parkersburg, W.Va.
Smith, Donald Charles	Arts-June'51	Bethlehem
Smith, Earl Leslie	M.E.-Feb.'50	Honesdale
Smith, Joe Andrew, Jr.	Bus.-Feb.'49	Hellertown
†Smith, Robert Langland	E.M.-June'50	Ridgewood, N.J.
Smith, Warren Leroy	Bus.-June'49	Floral Park, N.Y.
Smith, William B.		Bethlehem
Smith, William Layton	Bus.-Feb.'50	Plainfield, N.J.
Smoyer, Thomas Edwin	I.E.-June'51	Allentown
Snyder, Jackson Seidel	M.E.-Oct.'48	Wernersville
Snyder, Merritt Elwood	I.E.-June'49	Allentown
*Snyder, Richard John		Palmerton
Snyder, Richard John	I.E.-June'50	West Orange, N.J.
Snyder, Samuel Franklin	M.E.-Oct.'48	Gettysburg
Snyder, William Tredway	E.E.-June'49	Carlisle
Solly, Joseph Birchall	Ch.E.-Feb.'49	Harrisburg
*Solomon, Caryl Ann Gordon		Bethlehem
Solt, Paul Ervin	M.E.-June'50	Allentown
*Soltys, Henry Albert		Emmaus
Somers, Donald Charles	I.E.-Feb.'49	Berkley, Mich.
Southworth, William Tracy	E.P.-Oct.'48	Philadelphia
Spescha, William Paul	Ch.E.-June'49	Philadelphia
Spilsbury, Hugh Gybbon, Jr.	Met.E.-June'49	Cranford, N.J.
Spinell, Donald Merrill	M.E.-June'51	Wilmington, Del.
Spirk, John Francis	G.C.D.	Bethlehem
Spontak, Joseph	E.P.-Oct.'48	Pottsville
Spooner, William Henry	E.M.-June'51	Bethlehem
Spradling, Richard DeWitt	Bus.-Oct.'48	Buenos Aires, Argentina
Springman, Eugene Robert	M.E.-Feb.'51	Philadelphia
Stahl, Robert Edward	C.E.-June'49	Shamokin
Stalknecht, David Owen	I.E.-Feb.'49	Westfield, N.J.
Stanier, John Stewart, Jr.	C.E.-June'51	Youngstown, Ohio
Stanishefski, Joseph Raymond	C.E.-Oct.'48	Kulpmont
Stauffer, Francis Eugene	E.E.-Feb.'50	York
Steigerwalt, Bertine Brown	Bus.-Feb.'49	Bowmanstown
Stellato, Carmon John	M.E.-Feb.'51	Bethlehem
Stern, Stuart Emanuel	Arts-Oct.'48	Jenkintown
Stevens, Robert James	M.E.-Oct.'48	Baltimore, Md.
Stiles, Charles Elmer Ernest, Jr.	Bus.-Oct.'48	Catasauqua
Stiles, Edward Carl Ernest	M.E.-Feb.'51	Bethlehem
Stiles, Wilbur Barrington	Arts-Feb.'51	Easton
†Stires, Donald Huntoon	C.E.-June'50	Somerville, N.J.
Stiver, Walter Joseph Crowder	M.E.-June'49	Philadelphia
Stoll, Fred Charles	C.E.-June'49	New York, N.Y.
Stout, Henry Walter, Jr.	M.E.-Feb.'50	Bethlehem
Strohl, George Wilson	M.E.-Feb.'49	Bethlehem

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*Summer Session.
†Summer Engineering Courses.

Suereth, Dale Nagle	Bus.-Feb.’50	York
Suereth, Edward Clifford, Jr.	Bus.-Feb.’49	York
Sullivan, James Aloysius, Jr.	E.M.-Feb.’51	Jersey City, N.J.
Summers, Thomas Gillmer	Bus.-Feb.’50	Warren, Ohio
Swanberg, Sixten Curt	I.E.-Feb.’50	Brooklyn, N.Y.
Swartzwelder, George Mark, Jr.	Ch.E.-Feb.’51	Reading
Swenson, Charles Edward	Bus.-Feb.’51	Grosse Pointe, Mich.

Tabor, Clarence John, Jr.	E.E.-June’50	Ashland
Taylor, Edmund Pendleton	M.E.-Feb.’50	Wheeling, W.Va.
Teden, Herbert Eugene, Jr.	Bus.-Feb.’49	Chatham, N.J.
Thomas, George Franklin	M.E.-June’50	Harrisburg
Thomas, Lucille Audrey		Bethlehem
†Thompson, Charles Douglas	E.M.-June’51	White Plains, N.Y.
Thorpe, Richard Gardiner	Bus.-Feb.’49	New Haven, Conn.
Tiesler, Robin Feist		Riegelsville
Tiffany, Phillip Miller	I.E.-June’49	Kingston
Timmins, John Francis	M.E.-June’50	Bethlehem
Tomaras, Zenophon George		Shenandoah
Tomaselli, Julius Louis Francis	Ch.E.-June’50	Cliffside Park, N.J.
Torpey, Stephen Edmund	Arts-June’49	Bethlehem
*Trefny, William Joseph		Hellertown
Trethaway, William III	I.E.-June’51	East Orange, N.J.
†Trost, Douglas Charles	C.E.-June’51	Staten Island, N.Y.
Trost, George Paul	Met.E.-June’50	Williamsport
Trout, Jack Roland	Chem.-June’49	New Freedom
Trucksess, Andrew William	I.E.-June’51	Haddonfield, N.J.
Tucker, Jack Ernest	Bus.-Feb.’51	Latrobe
Turn, Kenneth Edwin, Jr.	Arts-June’49	West Hartford, Conn.

Unver, John Frederick	Bus.-June’51	Montvale, N.J.
Updegrave, Walter Charles	M.E.-June’51	Coopersburg
Ursic, Henry Simon	G.C.D.	Easton

Valeur, Jensen Sven	M.E.-June’51	Copenhagen, Denmark
VanAllen, Harry Roland	Bus.-Feb.’49	Queens Village, N.Y.
*VanHorn, Marlon James		Allentown
VanKeuren, John William	Bus.-June’50	Bethlehem
VanLeuven, Norman Harry	Bus.-Oct.’48	Westfield, N.J.
VanNest, Arthur Claude	I.E.-Feb.’50	Parkersburg, W.Va.
*VanNorman, Luella Mae		Slatington
Vath, Daniel Edwin	M.E.-June’49	Reading
Velie, Carl Powers	Bus.-Feb.’50	Painted Post, N.Y.
Vetter, Albert Stephen	Bus.-Feb.’50	Califon, N.J.
Vogt, George Louis	Bus.-Feb.’50	Reading
Vogt, George Robert	Bus.-June’50	Newark, N.J.
*Voltolina, Rena Mary		Bethlehem
Voorhees, Franklin Charleston	Bus.-June’50	Easton
Voros, Charles Franklin	Bus.-Feb.’51	Bethlehem
Vosbury, Richard Francis	Arts-Oct.’48	Falls Church, Va.
Vroome, Elwood Pearson	I.E.-June’51	Bethlehem

Wager, Gilbert Carl	E.E.-Feb.’50	Bronx, N.Y.

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*Summer Session.
†Summer Engineering Courses.

Wagner, John Harold, Jr.	M.E.-Oct.'48	Bethlehem
Wagonhurst, Robert Hertzog	Bus.-Feb.'49	Bechtelsville
Wait, John Richard	Bus.-June'50	Detroit, Mich.
Walden, Robert Louis	Bus.-Feb.'49	New York, N.Y.
Walker, John Lawrence	Bus.-Oct.'48	Nyack, N.Y.
Walker, Roy Miller	M.E.-Feb.'49	Bethlehem
Wall, William Edward	M.E.-Feb.'51	Cristobal, C. Z.
Walter, Paul Charles	Arts-June'49	Bethlehem
Walter, Raymond Thomas, Jr.	Bus.-Oct.'48	Ridgewood, N.J.
Walton, Howard LeRoy	C.E.-June'49	Woodlynne, N.J.
Wane, Malcolm Trafford	E.M.-June'50	Pittston
*Ward, Evelyn Davidson		Bethlehem
Ward, Frank Joseph	Bus.-June'49	Richmond Hill, N.Y.
Ward, John Albert	Bus.-June'51	Westfield, N.J.
Warg, Thurlow Robert	Bus.-June'50	Bethlehem
Wartman, Robert Clayton	Bus.-Feb.'49	Bethlehem
Watson, Robert Clement, Jr.	Arts-Feb.'49	Silver Spring, Md.
Watson, Stanley Philip	Bus.-Feb.'49	Allentown
Wavrek, Charles Dewey, Jr.	Bus.-Feb.'49	Fullerton
Way, Townsend Lawrence, Jr.	Bus.-June'49	Havertown
Weber, Charles Anthony	Arts-Feb.'50	Hellertown
Weber, Donald Kenneth	Bus.-Feb.'49	Shillington
Weisel, Merrill Godshall	Bus.-June'50	Sellersville
Welanetz, Peter Paul	C.E.-June'49	Bethlehem
Welliver, William Emory	Bus.-Feb.'50	Trenton, N.J.
Weltz, Robert Earl	G.C.D.	Swarthmore
Werst, Weston Homer	I.E.-Feb.'50	Bethlehem
Wesolowski, Chester	M.E.-Feb.'49	Providence, R. I.
West, Frank Edward	Arts-June'50	Scranton
Wetzel, Jack David	M.E.-Feb.'49	Green Lane
Wetzel, Richard Carl	I.E.-June'51	Allentown
Whittaker, Douglas Harold	Bus.-June'51	Shelton, Conn.
*Wieder, Alda Mazie Popst		Allentown
Wieder, Robert Edward	Bus.-June'49	Reading
Wiegand, August Frederick	I.E.-June'49	Fords, N.J.
Wiegner, Andrew Newton, Jr.	M.E.-Feb.'51	Bethlehem
Wiersma, Volkert	M.E.-June'49	East Orange, N.J.
†Wilkinson, Samuel Barton	C.E.-June'51	Mt. Carmel
Williams, Charles Henry Rice	Bus.-June'50	Hazleton
Williams, Donald Frederick	Arts-Feb.'49	Allentown
†Williams, Eugene Griffin	Arts-Feb.'51	Media
*Wilson, Charles David		Ford du Lac, Wis.
†Wilson, John Edgar Miller, Jr	E.M.-June'51	Pittsburgh
Wilson, Kenneth Morley	Arts-June'49	Merchantville, N.J.
Windish, Joseph Ronald	Bus.-Feb.'50	Allentown
Winkel, Robert Bates	I.E.-Oct.'48	Bethlehem
Wirth, Richard Alfred	Chem.-Oct.'48	Allentown
Wittemann, Ross Gardner	M.E.-June'51	Maplewood, N.J.
Wolf, John Carl	E.E.-June'51	Hawthorne, N.J.
Wolfe, Lewis Harvey	Met.E.-Feb.'49	Nazareth
Wong, Kit Ying	Met.E.-June'50	Oranjestad, Aruba
Wood, Duncan MacKenzie	C.E.-June'50	New York, N.Y.
Woods, Helen Curtis		Winnetka, Ill.

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*Summer Session.
†Summer Engineering Courses.

Woolman, Richard Hulme	M.E.-June'51	New Hope
Wright, George Herbert	M.E.-Oct.'48	Evanston, Ill.
Yale, David Rodney	C.E.-June'51	Northampton
Yatsko, Michael Andrew	M.E.-June'50	New York, N.Y.
Yocum, George Mack II	Bus.-Feb.'49	Lansdale
*Yoder, John Albert		Allentown
Young, Roy Beverson, Jr	M.E.-June'51	Morton
Young, Thomas Edwin	Ch.E.-Feb.'49	Manheim
Youtz, John Aaron	I.E.-Oct.'48	Haddonfield, N.J.
Yuill, Robert William		Easton
Zack, Raymond Anthony	I.E.-June'49	Pittston
Zeigler, Basil Morgan	G.C.D.	Bethlehem
*Zellner, Ada Lovina		Bethlehem
*Zettelmoyer, Karl Albert		Palmerton
*Zickel, Hannah Mary		Bethlehem
Ziegler, John Frederick	Bus.-June'50	Nazareth

Fall and Spring Semesters 1948-1949

Abbott, James Latimer	C.E.-June'50	Luzerne
Abicht, Wolfram Arthur	M.E.-Feb.'50	Berkshire Heights
Abouchar, Richard Charles	Bus.-June'52	Brooklyn, N.Y.
Abramovitz, Alan Emanuel	Arts-June'50	Flushing, N.Y.
Accorti, Abel Robert	Bus.-June'50	West Norwood, N.J.
Achard, Francis Hermann, Jr.	E.E.-June'49	Westfield, N.J.
Achterman, Leo Alexander, Jr.	C.E.-June'49	Stroudsburg
Adair, Donald Leonard	Arts-June'51	Bethlehem
Adam, John Sheldon	M.E.-Feb.'49	Prospect Park
Adami, Arthur Edward	M.E.-June'51	St. Albans, N.Y.
Adams, Douglas Strickland	E.E.-June'49	Montclair, N.J.
Adams, Edward Stratemeyer	E.E.-June'50	Maplewood, N.J.
Adams, Elmer Haney	Bus.-June'51	New York, N.Y.
Adams, Francis Patrick	Bus.-June'51	Bethlehem
Adams, Henry James	Arts-June'52	Baltimore, Md.
Adams, Mark Conway	Ch.E.-June'51	Great Neck, N.Y.
Adamthwaite, Frank Vipond, Jr.	Arts-June'50	New York, N.Y.
Adda, Lionel Paul	E.P.-June'49	Allentown
Adler, George Irwin	Ch.E.-Feb.'49	Bayonne, N.J.
Ahern, Andrew George	I.E.-June'50	Philadelphia
Ahern, John Francis	E.P.-June'49	Philadelphia
Ahrenhold, Henry III	C.E.-June'50	Manhasset, N.Y.
Ainslie, Cowgill Donn	Bus.-Feb.'49	Bethlehem
Airey, Clifford Scott	M.E.-Feb.'51	East Orange, N.J.
Aitken, Alfred Hetherington	E.P.-June'49	New York, N.Y.
Ake, Thomas Bellis, Jr.	Bus.-Feb.'51	Bethlehem
Akerboom, Jack	Ch.E.-June'49	Bridgeton, N.J.
Aktutay, Mehmet Tugrul	Met.E.-Feb.'49	Ankara, Turkey
Albert, William Westermayr	M.E.-Feb.'50	Trenton, N.J.
Albrecht, Robert Henry	I.E.-June'51	Highlands, N.J.
Alexander, Richard Clair	Bus.-June'51	Lowville, N.Y.
Alexander, William Earl, Jr.	E.E.-June'49	Lancaster
Alexander, William Hopkins, Jr.	I.E.-Feb.'51	Secane

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*Summer Session.

Alexy, David William	Bus.-Feb.'50	Bethlehem
Alich, Frank George	Ch.E.-June'52	Nazareth
Allan, Donald Everett	Chem.-Feb.'50	Bronxville, N.Y.
Allen, Charles Wesley III	Bus.-June'50	Ishpeming, Mich.
Allen, George John	E.M.-Feb.'51	Hazleton
Allen, George Wilbur	E.P.-Feb.'50	Budd Lake, N.J.
Allen, Howard	Ch.E.-June'52	Wheatland
Allen, John Edward	I.E.-June'51	West Englewood, N.J.
Allen, Milton	C.E.-June'49	Norristown
Allen, Richard Charles	E.P.-June'50	Elmira, N.Y.
Allen, Richard Marshall	E.E.-June'51	East Orange, N.J.
Allen, Wesley Edward	Ch.E.-June'50	Brooklyn, N.Y.
Allgaier, William Arthur	E.E.-Feb.'50	Hazleton
Alling, Guy Ethan, Jr.	Chem.-June'52	Athol, Mass.
Alteneder, Theodore George, Jr.	Met.E.-June'51	Cheltenham
Ament, Miles Kendig	I.E.-Feb.'49	Lancaster
Amish, John Stuart	Bus.-Feb.'52	Webster, N.Y.
Ammon, David Gould	M.E.-June'50	Caracas, Venezuela
Anders, James Edward	M.E.-Feb.'51	Bethlehem
Anders, Patrick Lloyd	Arts-June'49	Bethlehem
Anderson, Frank Olaus II	I.E.-Feb.'50	Bemus Point, N.Y.
Anderson, Harvey Emanuel	Bus.-June'49	Rochester, N.Y.
Anderson, John Robert	E.E.-June'49	Lancaster
Anderson, Ralph Neal	I.E.-June'50	Bethlehem
Anderson, Robert Edward Lee	C.E.-June'51	Lancaster
Andler, Robert Christian	Bus.-June'50	Kenmore, N.Y.
Andrews, Alday Bishop	E.P.-June'52	Ridgewood, N.J.
Andrews, Chester Carl	M.E.-June'51	Allentown
Andrews, Theodore Ernest	M.E.-June'52	Rahway, N.J.
Ankeny, Howard Ray	E.E.-June'52	Uniontown
Antalics, Stephen Charles	Arts-Feb.'52	Bethlehem
Antas, Stanley Casimir	M.E.-Feb.'49	Newark, N.J.
Anthony, Frederic Paul	Bus.-June'51	Bethlehem
Anthony, John	Ch.E.-June'52	Staten Island, N.Y.
Antrim, William Drown, Jr.	M.E.-June'51	Gloucester, N.J.
Applegate, Howard Cornell	E.E.-Feb.'49	Madrid, Spain
Arbizzani, Amedeo	C.E.-June'49	Bethlehem
Archer, Ralph Curtis, Jr.	E.P.-June'51	Highland Park, Ill.
Archinal, Walter Charles	Ch.E.-June'52	Munson Hempstead, N.Y.
Arentzen, Leif Erick	E.E.-June'52	Pittsburgh
Arlt, Herbert George, Jr.	Chem.-Feb.'50	Basking Ridge, N.J.
Armstrong, Franklin Wyllis	Bus.-June'49	Stewart Manor, N.Y.
Armstrong, James John, Jr.	Bus.-June'50	Trenton, N.J.
Armstrong, Newell Harvey	Bus.-June'50	Trenton, N.J.
Arndt, Robert Vincent	C.E.-June'52	Allentown
Arner, William Reinhold	M.E.-Feb.'49	Highspire
Arnold, Frederick Jay	Bus.-June'52	Wyncote
Arnold, Herbert Stephen, Jr.	M.E.-Feb.'50	Lebanon
Arrison, Frank Christian	Arts-June'50	Philadelphia
Arthur, James John	Arts-June'50	Plymouth
Arzberger, Robert William	E.E.-Feb.'52	Annandale, N.J.
Ash, Richard Asher	Arts-June'50	Philadelphia
Ashbridge, George Harry, Jr.	E.E.-June'52	Chester
Ashley, Milton Vincent, Jr.	I.E.-Feb.'49	Iselin, N.J.

Ashmead, William Bassett	Bus.-June’51	Philadelphia
Assetto, Valentino John	C.E.-June’49	West Chester
Astringer, John Joseph	Ch.E.-June’49	Scranton
Astrove, George	M.E.-June’49	New Rochelle, N.Y.
Atkins, Joseph Winder, Jr.	Arts-June’49	Gloucester, Va.
Atkinson, Gordon	Chem.-June’52	Grove City
Attaway, John Rush	Bus.-Feb.’49	Charleston, S. C.
Atwood, Donald Clifford	Bus.-Feb.’49	Watertown, Conn.
Auld, Andrew Jackson	M.E.-June’49	Birmingham, Ala.
Aungst, Stanley Eugene	Chem.-June’52	Harrisburg
Avakian, Leon Samuel	C.E.-June’49	Bogota, N.J.
Avery, Eugene Cone	E.P.-Feb.’49	Chicago, Ill.
Avey, John Jacob, Jr.	Bus.-June’49	Beltsville, Md.
Ayers, William DeWitt, Jr.	C.E.-June’52	West Allenhurst, N.J.

Bacon, David Dunlap	E.P.-June’51	North Haven, Conn.
Bader, John Willard	E.M.-June’49	Pittsford, N.Y.
Baer, Gordon Reed, Jr.	I.E.-Feb.’50	Johnstown
Baier, Brooke Rishe	M.E.-Feb.’49	Palmyra
Baile, George Howard	Met.E.-June’49	Haddonfield, N.J.
Bailey, George Thomas	Ch.E.-June’52	Rocky River, Ohio
Bailey, Wayne Dietrich	M.E.-Feb.’49	Reading
Baines, Ernest Leh	E.E.-June’49	Allentown
Baird, Gordon Edward	Arts-Feb.’52	New York, N.Y.
Baker, David George	Arts-June’52	Short Hills, N.J.
Baker, Dexter Farrington	M.E.-June’50	Upper Darby
Baker, Harry Jack	Bus.-Feb.’50	Allentown
Baker, Joseph Robert	I.E.-June’49	Hazleton
Baker, Raymond Francis	M.E.-June’49	Philadelphia
Baker, Rex McClain, Jr.	Bus.-Feb.’50	Sparrows Point, Md.
Baker, Richard Alan	Ch.E.-Feb.’49	Allentown
Balch, Thomas Vickroy, Jr.	I.E.-June’52	Shaker Heights, Ohio
Baldwin, Cyril Crockett, Jr.	Ch.E.-Feb.’50	South Orange, N.J.
Baldwin, David McGrath	Bus.-June’51	South Orange, N.J.
Baldwin, Gilbert Ostman	Met.E.-Feb.’50	Niagara Falls, N.Y.
Baldwin, Theodore Davis	Bus.-June’51	South Orange, N.J.
Balestier, Jackson Wolcott	Arts-June’52	Hackensack, N.J.
Ball, Charles Field, Jr.	M.E.-June’52	Franklin
Ball, Fred Rowley	E.E.-June’51	Chatham, N.J.
Baloga, John Martin	Bus.-Feb.’49	Swoyerville
Baltrus, John Robert	Ch.E.-June’50	Wilkes-Barre
Banker, Donald Byrne	Ch.E.-June’51	Baldwin, N.Y.
Banks, John Elkins	Arts-Feb.’51	Trenton, N.J.
Banks, Malcolm Robert	M.E.-June’52	Ridgewood, N.J.
Banks, Vere James	M.E.-June’49	Stroudsburg
Bannister, Robert Norwood	Bus.-Feb.’51	Rockville Centre, N.Y.
Banta, Robert Harrington	Bus.-June’52	Union City, N.J.
Banzhof, William Stanley, Jr.	M.E.-June’51	Rockaway, N.J.
Bara, Edward Joseph	E.M.-June’52	Yorkville, N.Y.
Barbato, Theodore, Jr.	Bus.-June’49	White Plains, N.Y.
Barclay, Frank Traynor	I.E.-Feb.’51	North Wales
Barclay, Thomas Desmond, Jr.	M.E.-June’49	North Wales
Bard, Wendell Emsing	E.E.-June’49	Kutztown
Barkhorn, Lee Joseph	Bus.-Feb.’49	South Orange, N.J.
Barlow, Donald Eugene	Bus.-June’50	Cheltenham

Barlow, Frank Hamilton	Bus.-Feb.'51	Philadelphia
Barna, Stephen	Arts-June'49	Pottstown
Barnes, Donald Keith	E.E.-Feb.'52	Mechanicsburg
Barnes, Joseph Thomas, Jr.	M.E.-Feb.'52	Allentown
Barnett, Joseph Edgar	Bus.-June'49	Latrobe
Barnett, Roy Irving, Jr.	E.E.-Feb.'51	Lynbrook, N.Y.
Barney, William Arthur	Bus.-June'52	Philadelphia
Barnicle, Thomas Michael	I.E.-June'49	Pelham, N.Y.
Barr, James Fleming, Jr.	Bus.-June'51	Philadelphia
Barrett, Joseph James	M.E.-Feb.'50	Plymouth
Barrett, Robert Edward	E.M.-June'52	Johnstown
Barron, William Thomas	E.E.-June'49	Allentown
Barry, George Redmond	Ch.E.-June'52	Mt. Kisco, N.Y.
Barry, Robert Edward	Ch.E.-June'50	New York, N.Y.
Barry, Thomas Rogers	Bus.-June'49	Lambertville, N.J.
Barteau, John Frank, Jr.	M.E.-June'52	West Haven, Conn.
Barth, Charles Adolph	Chem.-June'51	Philadelphia
Barthelson, Norman Adam	Ch.E.-June'50	West Englewood, N.J.
Barthold, Lee Girard, Jr.	Bus.-Feb.'50	Cos Cob, Conn.
Bartholomew, Calvin Paul	Bus.-June'51	Bethlehem
Bartholomew, Frank Stewart	Bus.-June'49	Westfield, N.J.
Bartholomew, Richard Edward	Arts-June'51	Bethlehem
Bartlett, A. Crawford	E.E.-June'52	Hempstead, N.Y.
Bartlett, Charles Frederick	Bus.-June'51	West Hartford, Conn.
Bartush, Andrew Paul	Ch.E.-Feb.'52	Avoca
Basiago, Raymond	E.E.-June'51	Summit Hill
Baskerville, Edward John	Ch.E.-Feb.'50	Paterson, N.J.
Bast, DeForrest Smoyer	C.E.-June'49	Bethlehem
Bast, Ray Rogers	E.E.-June'50	Kutztown
Bastianelli, Herman Martin	Bus.-June'49	Bethlehem
Batiuk, Richard Anthony	Chem.-June'51	Scranton
Batson, Frederick James, Jr.	Bus.-Feb.'50	Buffalo, N.Y.
Bauder, Roy Edward	Arts-Feb.'50	Hellertown
Bauer, Hellmut Dietrich Wilhelm	C.E.-June'50	Bremen, Germany
Baugham, Robert Dale	Bus.-June'52	Brookville
Baynum, Robert Davis	Arts-June'50	Maplewood, N.J.
Be, Allan Wie Hwa	Arts-June'52	Leonia, N.J.
Be, Stanley Wie Go	Ch.E.-Feb.'52	Leonia, N.J.
Bealer, John Levi	Bus.-June'51	Bethlehem
Beam, John LeMar	M.E.-June'51	Ephrata
Beard, John Shepard	Ch.E.-June'49	Philadelphia
Beardslee, Alvord Miner	Arts-Feb.'50	Bethlehem
Beatty, George Ronald	Ch.E.-June'52	White Plains, N.Y.
Bechtel, Rodney Earl, Jr.	C.E.-June'51	Bethlehem
Beck, Donald Richard	Bus.-June'52	Union City, N.J.
Beck, Harold Robertshaw	M.E.-June'52	Philadelphia
Beck, Robert Edward	Bus.-June'49	Englewood, N.J.
Beck, Robert Kling, Jr.	Arts-June'50	Shaker Heights, Ohio
Beck, William Carl	Met.E.-June'50	Laureldale
Becker, Edward Martin	Bus.-June'52	Hellertown
Becker, Edward Paul	C.E.-June'51	Bethlehem
Bedell, David Scarlett	Bus.-Feb.'51	Montclair, N.J.
Bedson, Joseph Henry, Jr.	Arts-June'50	Trenton, N.J.
Beebe, Steven Grosvenor	Ch.E.-June'52	Washington, D. C.
Beegle, Robert Floyd	M.E.-June'50	Blairstown, N.J.

Behler, Nelson Robert	C.E.-Feb.’50	Tamaqua
Behm, Frederick Fetter	E.E.-June’49	Esterly
Beiler, Richard Frederick	Ch.E.-June’52	Langhorne
Beinlich, Eric George, Jr.	E.M.-June’52	Easton
Beisel, Frederick Arlington, Jr.	E.E.-June’51	Allentown
Beisheim, Charles Donald	Arts-Feb.’49	Irvington, N.J.
Bell, Alfred William	E.E.-June’51	Brooklyn, N.Y.
Bell, Ian Clayton	Bus.-June’51	East Orange, N.J.
Bell, Vincent Gruber, Jr.	M.E.-Feb.’49	East Orange, N.J.
Bella, Roger Edward	Bus.-Feb.’51	Byran, Conn.
Bellante, Emideo Lawrence	I.E.-June’49	Easton
Belmonte, Thomas Simon	Arts-Feb.’49	Herkimer, N.Y.
Bender, John Jacob, Jr.	I.E.-June’49	Fair Lawn, N.J.
Bender, Robert William	E.E.-June’51	Allentown
Bender, William Harris	Met.E.-June’49	West Orange, N.J.
Benner, Richard Owen Howard	Bus.-June’49	Bethlehem
Benson, Morris Darrel	Bus.-Feb.’51	Searcy, Ark.
Berasley, Andrew, Jr.	E.E.-Feb.’51	Fayetteville, N. C.
Berdan, John VanHouten	Ch.E.-June’49	Glen Ridge, N.J.
Berg, Walter Philip, Jr.	Arts-Feb.’52	Pittsburgh
Bergey, David William	Met.E.-Feb.’51	Pottstown
Bergman, John William	Arts-June’52	McKeesport
Bergmiller, Edgar Allan	Bus.-June’52	Belleville, N.J.
Bergstresser, Lee Robert	M.E.-Feb.’49	Hellertown
Bergum, Roger Ferdinand	E.E.-Feb.’50	Lombard, Ill.
Berlin, Harold Robert, Jr.	Bus.-June’51	Scarsdale, N.Y.
Bernard, Thomas Edward	Arts-June’50	Great Neck, N.Y.
Berndt, Donald William	Bus.-June’51	Port Jefferson, N.Y.
Bernicker, Eugene Thomas	Bus.-June’49	Ventnor, N.J.
Berry, Charles Smithman	I.E.-June’52	Oil City
Berry, Charles Wilson	Ch.E.-June’52	Staten Island, N.Y.
Berry, David Larmer	Bus.-June’50	Bethlehem
Betts, Herbert Patterson, Jr.	Bus.-Feb.’49	Madison, N.J.
Betz, Robert Herman	M.E.-June’49	Philadelphia
Bevier, Louis Wells	I.E.-June’51	Scarsdale, N.Y.
Bewley, Donald Thomas	E.E.-June’49	Bethlehem
Bewley, Robert Lynn	Bus.-Feb.’49	Bethlehem
Beyer, Ronald Arthur	Ch.E.-Feb.’50	Bogata, N.J.
Bickel, James Gerald	Ch.E.-Feb.’49	Allentown
Bickett, Peter Burton	Bus.-June’52	Westfield, N.J.
Bickle, Robert Sheldon	M.E.-June’49	Bethlehem
Biddleman, Albert Franklin	Arts-June’51	West Hartford, Conn.
Biedler, William Thomas III	Ch.E.-June’50	Baltimore, Md.
Biemesderfer, Donald John	M.E.-June’52	Lancaster
Bieret, James Frederick	M.E.-Feb.’50	Allentown
Bierman, Jordan Baer	Ch.E.-June’49	New Rochelle, N.Y.
Bigatel, John Daniel	M.E.-June’51	Allentown
Billhimer, Robert Dale	Bus.-June’50	Manhasset, N.Y.
Bills, Robert Arthur	C.E.-June’51	Wayne, Mich.
Bingaman, Malcolm Adam	E.E.-June’52	Reading
Bingham, George Herbert, Jr.	E.P.-Feb.’49	Scranton
Binns, George Hindle	Ch.E.-June’49	Bethlehem
Binzen, Willard	C.E-.June’50	Bloomfield, N.J.
Bisczat, Raymond Frank	Ch.E.-June’52	Wanamie
Bistritz, Richard Martin	Arts-June’52	Bethlehem

Bittenbender, Melvin	C.E.-Feb.'50	Pottstown
Bixler, Donald Arthur	E.E.-June'51	Shamokin
Black, Charles Gilbert III	Arts-June'52	Elizabeth, N.J.
Black, Joseph Elliott	Met.E.-June'49	New York, N.Y.
Blair, Donald Leroy	Arts-June'50	Sheffield
Blair, John Shetron	Bus.-Feb.'52	Camp Hill
Blaisdell, Colborn Theodore	Arts-June'52	Allentown
Blake, Johnson Cordeaux	Arts-June'52	Scarsdale, N.Y.
Blank, Russell Durell	Bus.-June'50	Bethlehem
Blau, William S. III	I.E.-June'49	Shaker Heights, Ohio
Blauvelt, Lon	C.E.-June'52	Wilmington, Del.
Blazejewski, John Joseph	Met.E.-Feb.'50	Pennington, N.J.
Blecher, Paul Alfred	Bus.-June'51	Danville
Bloch, Gilbert Merton	Bus.-Feb.'49	Flushing, N.Y.
Bloch, Marvin Wayne	E.E.-Feb.'52	Reading
Bloom, Albert Augustus	Ch.E.-Feb.'50	Margate City, N.J.
Bloomfield, William Frank	I.E.-June'52	Glen Ridge, N.J.
Blount, George Elliott	I.E.-June'51	Ambler
Boandl, Joseph Stanley	C.E.-June'52	Bethlehem
Bodnyk, Russell	I.E.-Feb.'49	Northampton
Boerner, Stewart Benjamin, Jr.	M.E.-June'50	Roslyn
Boltz, Kenneth Neil	Bus.-June'49	Jonestown
Bond, Edward Horace	Bus.-June'51	Newtown
Bond, John Henry, Jr.	C.E.-June'50	Bethlehem
Bond, Robert Naile	C.E.-Feb.'51	Reisterstown, Md.
Bondy, Arthur Edward	Bus.-June'52	Mt. Vernon, N.Y.
Bonfig, Henry Carl	Bus.-June'50	Winnetka, Ill.
Bonham, Robert Logan	Arts-June'50	Glen Gardner, N.J.
Boore, Lewis Alexander	C.E.-June'50	Niagara Falls, N.Y.
Borger, George Anthony	Bus.-June'52	Ridgewood, N.J.
Borgeson, Arthur Bruce	Bus.-June'49	Ridgewood, N.J.
Borneman, Peter Herman	Bus.-June'52	South Orange, N.J.
Borofski, Robert Leon	C.E.-June'52	Nanticoke
Borzellino, Salvatore	Arts-June'49	Paterson, N.J.
Bouton, Charles William	Ch.E.-Feb.'52	Kingston, N.Y.
Bovaird, Robert Lee, Jr.	E.P.-Feb.'49	Brockway
Bovankovich, John Carl	Ch.E.-Feb.'51	Monessen
Bowen, Henry Deifer, Jr.	Chem.-Feb.'51	Allentown
Bower, Richard Harding	E.E.-June'49	Nescopeck
Bowers, Delou	I.E.-June'50	Edgewater Park, N.J.
Bowler, Richard Kyle	C.E.-June'50	Pelham Manor, N.Y.
Bowman, Charles Willard	Ch.E.-June'51	Baltimore, Md.
Bowman, James Irvin	I.E.-June'51	Middletown
Bowman, John Willis	Bus.-June'50	Philadelphia
Bowman, Miles Augustus, Jr.	M.E.-June'50	Lebanon
Boyce, Frederick Hinkson	M.E.-June'52	Wallingford
Boyd, Richard	Bus.-June'50	Chatham, N.J.
Boyer, David Lentz	Bus.-June'50	Allentown
Boyer, Howard Allen	Ch.E.-June'51	Bowmanstown
Boyer, John Harry	Bus.-Feb.'49	Wilkes-Barre
Boyer, John Robert	M.E.-June'50	Norristown
Boyer, William Stanley	Bus.-Feb.'49	Allentown
Boyhont, Donald Stephen	M.E.-Feb.'52	Nazareth
Boyle, Edward Baxter, Jr.	E.E.-June'49	West Englewood, N.J.
Boyle, George Edward	E.P.-June'52	Sunbury

3

Brabant, Jacques Charles	M.E.-June'52	Scranton
Brabant, Yvan Emile	Ch.E.-June'52	Scranton
Brader, Wilbur Thomas	Ch.E.-June'51	Bethlehem
Bradley, Charles William	E.E.-June'51	Nutley, N.J.
Bradley, Richard Ellsworth	E.E.-June'50	Wyoming
Brady, George Leonard	C.E.-June'49	Freeport, N.Y.
Brady, Richard Michael, Jr.	I.E.-Feb.'51	Bethlehem
Braik, George David	E.P.-June'51	Upper Darby
Branch, Richard	E.M.-June'50	Nesquehoning
Brandt, Henry William	E.M.-June'50	Bethlehem
Brandt, Louis Frederick	Ch.E.-June'51	Wilkes-Barre
Brechbill, Guy Lester	Ch.E.-June'50	Bethlehem
Breck, William Rogers, Jr.	Arts-June'50	Rosemont
Breiden, Millard Layton	Bus.-Feb.'50	Elkins Park
Breingan, William David	E.E.-June'51	Boyertown
Breitung, York Louis	Bus.-Feb.'50	Terryville, N.Y.
Brendel, Richard Otto	M.E.-June'51	Bloomfield, N.J.
Brennan, Thomas Matthew	C.E.-Feb.'52	Utica, N.Y.
Brennan, William Morgan	I.E.-June'49	Hollis, N.Y.
Brenner, John Arthur	Arts-Feb.'50	Plainfield, N.J.
Brew, Thomas Richard	I.E.-Feb.'50	Audubon, N.J.
Brewer, Joseph Blake	E.E.-June'49	Allentown
Brewer, Warren, Jr.	Arts-June'50	Bryn Mawr
Brey, Gerald Morris	C.E.-June'50	Emmaus
Bridgman, James Medlar	Bus.-Feb.'51	Philadelphia
Briedis, Frank Adam Brady	Bus.-Feb.'49	Pittston
Briening, Walter James	Bus.-June'49	Islip, N.Y.
Briody, Thomas Francis	Ch.E.-Feb.'50	Bethlehem
Brion, Dalton Franklin	M.E.-June'49	Williamsport
Britton, Wright	Bus.-June'50	Great Neck, N.Y.
Brong, Harold William	Bus.-Feb.'50	Bethlehem
Brothers, John Theodore	Arts-Feb.'50	Ware Neck, Va.
Brown, Claude Raymond, Jr.	Ch.E.-Feb.'50	Allentown
Brown, David Osmond	Ch.E.-June'49	Hastings-on-Hudson, N.Y.
Brown, Donald LeRoy	Arts-Feb.'52	Westfield, N.J.
Brown, Eugene Emery	Bus.-June'49	Chatham, N.J.
Brown, Henry Sugden	E.E.-June'50	Hellertown
Brown, James Thomas	I.E.-June'50	Chicago, Ill.
Brown, Thomas Joseph	Bus.-June'50	Bethlehem
Brown, William Julius, Jr.	E.E.-June'51	Bethlehem
Brown, William Morris, Jr.	Bus.-Feb.'50	Bethlehem
Brownback, John Kenneth	Arts-June'49	Bethlehem
Bruce, George Frederick	Bus.-June'50	East Orange, N.J.
Bruder, Norman Gilbert	M.E.-June'51	Emmaus
Brummitt, Wallace Brooks	Arts-June'49	Havelock, N. C.
Brunner, Robert Fretz	M.E.-Feb.'52	Pipersville
Brydle, Richard Loren	E.E.-Feb.'50	Allentown
Bryniarski, Albert Francis, Jr.	Bus.-June'51	Plainfield, N.J.
Buchanan, John Glisan	I.E.-June'49	Altoona
Buck, Harry William, Jr.	Met.E.-June'52	Bethlehem
Buck, Richard William	M.E.-Feb.'49	Bethlehem
Buckley, David Lanning	E.E.-June'52	Ocean City, N.J.
Buehler, Seymour Jack	Bus.-June'49	Brooklyn, N.Y.
Buell, Irving Foote	Bus.-June'52	Laconia, N. H.

Buhl, John Edward	C.E.-June'51	Plainfield, N.J.
Bullard, David Edward	Bus.-June'50	Bridgeport, Conn.
Bullock, Donald Bloom	Bus.-Feb.'49	Trenton, N.J.
Burk, Donald Charles	E.E.-June'51	Nutley, N.J.
Burkholder, Lester William	Bus.-June'51	Carlisle
Burnett, Bruce Burton	Chem.-June'50	Norristown
Burns, Joseph Peter	Arts-Feb.'51	Oxford, N.J.
Burroughs, David Bruce	I.E.-June'50	Pennington, N.J.
Burroughs, Edmund Andrew	Bus.-June'51	Titusville, N.J.
Burton, Franklin Louis	M.E.-June'50	Fallsington
Burton, Victor Charles	Met.E.-June'51	Bernardsville, N.J.
Busch, Donald George	E.E.-June'52	Madison, N.J.
Busch, Kenneth Joseph	E.E.-June'51	Madison, N.J.
Busch, Leonard	E.E.-June'49	Philadelphia
Bush, Lewis Phillip	E.M.-June'52	West Orange, N.J.
Bussmann, John William	Bus.-June'50	Woodbridge, Conn.
Butler, John William	E.E.-June'50	Belvidere, N.J.
Butterworth, Charles Melcher III	Arts-June'49	Lansdowne
Buttfield, Donald Carey	Arts-June'51	Plainfield, N.J.
Butts, Layton Elwood	E.P.-June'49	Wyomissing
Buzby, Charles Ernest III	Bus.-June'50	Wayne
Buzby, Robert Showell	I.E.-Feb.'52	Merchantville, N.J.
Bybell, Paul	Ch.E.-June'51	Coaldale
Byerly, John Allison, Jr.	Arts-June'52	Pittsburgh
Byrn, John David	Ch.E.-Feb.'49	Verona, N.J.
Byrne, Robert	E.E.-June'52	Avon, N.J.
Byrne, Robert Emmett, Jr.	E.E.-Feb.'49	Montclair, N.J.
Byrnes, Thomas Francis, Jr.	Bus.-June'50	Hartford, Conn.

Caimi, Joseph Augustine	Bus.-Feb.'51	Philadelphia
Cairns, James Robert	Arts-June'50	Wayne
Callas, George William	Bus.-June'51	Jersey City, N.J.
Calvert, Harvey Thomas	Bus.-June'52	Upper Darby
Calvert, John William	Arts-Feb.'50	Williamsport
Camarda, Casper Michael	Bus.-June'52	Bethlehem
Cameron, Donald Robert	Bus.-June'50	Chatham, N.J.
Cameron, Edward Duncan	Bus.-Feb.'50	Allentown
Campbell, Russell Arndt	Arts-June'52	Gettysburg
Campbell, William Gibson	M.E.-June'50	Bronxville, N.Y.
Canavan, Richard John	Bus.-June'49	Floral Park, N.Y.
Canfield, Robert Emerson	Ch.E.-June'52	Summit, N.J.
Carey, Ralph Pratt	Arts-June'52	Ivyland
Carlin, Francis Xavier	Arts-Feb.'49	Margate City, N.J.
Carlin, Thomas Francis	M.E.-June'50	New Castle
Carlson, Carl Robert	M.E.-June'49	Kane
Carlson, Robert Henry	Bus.-Feb.'50	Washington, D. C.
Carlton, Douglas Leon	M.E.-June'50	Endicott, N.Y.
Carney, Joseph James	Ch.E.-Feb.'52	Belleville, N.J.
Carpenter, Laurence Everett	Bus.-June'51	South Orange, N.J.
Carpenter, Lee Crittenden	E.E.-June'50	Coudersport
Carroll, Graham Michael	I.E.-June'51	Atlantic City, N.J.
Carroll, John Millar	I.E.-June'50	Farmingdale, N.Y.
Carroll, Richard Patrick	Bus.-June'49	East Orange, N.J.
Carson, Robert Charles	E.M.-June'51	Bethlehem
Carson, William Pitts, Jr.	Bus.-Feb.'52	Philadelphia

Carter, Russell Paul, Jr.	Chem.-June’51	Princeton, N.J.
Carter, William Allen	E.E.-Feb.’51	Warren
Carthage, William Henry	M.E.-Feb.’51	Dover, N.J.
Cartmell, Derwent Dale	M.E.-June’52	South Orange, N.J.
Case, James Patrick	Bus.-June’49	Bethlehem
Case, John Robert	Ch.E.-June’52	East Orange, N.J.
Case, Sherwood Wayne	Bus.-June’50	Pen Argyl
Casey, William Lee	M.E.-June’52	Pennsburg
Cashman, Thomas Michael	I.E.-Feb.’50	Arlington, Mass.
Cashmore, Robert Carlyle	Bus.-June’52	Elizabeth, N.J.
Casiraghi, Gilbert Alexander	Chem.-Feb.’52	New Rochelle, N.Y.
Cassano, Joseph Frederick	Met.E.-Feb.’51	Bethlehem
Cassebeer, George Sabey	M.E.-Feb.’52	Rochester, N.Y.
Cassel, Arno	E.E.-Feb.’52	Easton
Cassidy, Richard William	Bus.-June’51	Elizabeth, N.J.
Castle, Donald Ward	Bus.-June’49	Montclair, N.J.
Castner, Daniel Ellingwood	Bus.-June’51	Succasonna, N.J.
Castor, Bernard Wilbur	Arts-June’52	Richmond Hill, N.Y.
Caulkins, David Cain	E.E.-Feb.’50	Cleveland Heights, Ohio
Cawley, Hugh Fraser	M.E.-June’51	Montclair, N.J.
Cesare, Arthur Victor	C.E.-Feb.’51	Pen Argyl
Chalupa, Martin	M.E.-June’51	Lansford
Chambers, Donald Ellsworth	Bus.-June’52	Westfield, N.J.
Chandler, Raymond Benjamin	M.E.-June’51	Westport, Conn.
Chapman, Harold William	E.E.-June’51	Windber
Chapman, Roland Chester	Bus.-June’49	Elkins Park
Chapman, Thomas Willis	I.E.-June’52	Ardmore
Chase, Robert Clifford	Ch.E.-June’51	Hackensack, N.J.
Cheetham, Rodger Price	E.E.-Feb.’51	Philadelphia
Chemnitius, Eric Minte	M.E.-Feb.’50	Summit, N.J.
Cheney, Elliott Ward, Jr.	Arts-June’51	Bethlehem
Chesnut, Walter Granville	E.P.-June’50	Upper Montclair, N.J.
Chew, Edgar Francis, Jr.	Arts-June’49	Haddonfield, N.J.
Chidsey, Thomas Campbell	Bus.-June’51	Washington, D. C.
Chiles, Franklin Joseph	C.E.-June’49	Bethlehem
Chiles, James Bestor	C.E.-June’49	New Cumberland
Chin, Newton Bing	Arts-June’51	New York, N.Y.
Chisholm, Robert Audus	Chem.-June’50	Scarsdale, N.Y.
Chovanes, Eugene	M.E.-Feb.’50	Hazleton
Christ, Robert Bruce	Arts-June’50	Allentown
Christensen, William John	Bus.-June’51	Ventnor City, N.J.
Christiansen, Herbert Walter	M.E.-June’49	Nutley, N.J.
Christiansen, Theodore Waldemar	Ch.E.-Feb.’52	New York, N.Y.
Christie, John Allan	Arts-Feb.’49	Rochester, N.Y.
Christman, William Schirmer	I.E.-Feb.’50	North Wales
Chubb, Ralph	M.E.-June’49	Roslyn
Church, William Lewis	M.E.-Feb.’50	Lancaster
Chutter, Raymond Allan	Ch.E.-June’49	Glen Rock, N.J.
Ciaravino, Ignatius William	Arts-June’51	Freeport, N.Y.
Clare, Leslie Paul	Met.E.-June’50	Allentown
Clark, James Supplee	Met.E.-June’52	Glenside
Clark, John Craig	Bus.-June’49	Youngstown, Ohio
Clark, John Henry	Bus.-Feb.’49	Wayne
Clark, Robert Burgess	Arts-Feb.’50	Dobbs Ferry, N.Y.

Clarke, Edward Eugene	E.E.-June'49	White Plains, N.Y.
Claus, David William	Ch.E.-June'52	Berwick
Clay, Frederick Guion	M.E.-June'50	Washington, N.J.
Clayton, William Lawrence	Bus.-June'51	Tenafly, N.J.
Cliff, Thomas Edward	Arts-Feb.'49	Coopersburg
Clinkunbroomer, William George	Bus.-June'49	Orange, N.J.
Close, Charles Mollison	E.E.-June'50	Glen Ridge, N.J.
Close, Francis Dullam	Bus.-June'51	Plainfield, N.J.
Clymer, Ellwood Artman, Jr.	M.E.-June'49	Westmont, N.J.
Coale, Frank Steele	E.P.-June'52	Westfield, N.J.
Cobb, George Rexford	Bus.-June'51	Baldwin, N.Y.
Coffman, Frank William	I.E.-June'52	Glen Rock, N.J.
Coghlan, Kenneth Lloyd	Arts-June'49	Westfield, N.J.
Cohen, Nathan Lebovitz	E.P.-June'52	Baltimore, Md.
Cohn, Victor Hugo, Jr.	Chem.-June'52	Reading
Colbert, William French, Jr.	M.E.-June'49	Philadelphia
Coldren, Lester Allen	M.E.-Feb.'49	Shillington
Coleman, John Cresswell, Jr.	Bus.-June'51	Old Greenwich, Conn.
Coleman, William Heywood	M.E.-June'52	Philadelphia
Coletti, Robert Emile	Bus.-June'50	New Rochelle, N.Y.
Collin, Richard Ernest	Bus.-June'51	North Tarrytown, N.Y.
Collins, Benjamin Stockton	M.E.-June'49	Allentown
Collins, John Oliver, Jr.	Ch.E.-June'52	Westfield, N.J.
Collins, Lawrence Edward	E.P.-June'52	New York, N.Y.
Collins, Robert William	Bus.-June'49	St. Albans, N.Y.
Collins, William Joseph	Arts-June'51	Bethlehem
Collmann, Spencer Howe	Arts-June'49	Wilkes-Barre
Colmer, Robert Henry	M.E.-Feb.'50	Spring House
Colville, Roger Edward Bettes	Bus.-Feb.'42	Verona, N.J.
Combs, Stephen Albeck	I.E.-June'50	South Orange, N.J.
Comes, Richard Newell	M.E.-June'51	Woodbridge, Conn.
Commander, James Allen	Bus.-June'52	Florence, S. C.
Compton, Earle Augustus, Jr.	Bus.-June'49	Clinton, N.J.
Congdon, Raymond	Bus.-June'49	Glen Ridge, N.J.
Conklin, Richard Jessop	M.E.-June'51	Bernardsville, N.J.
Conlin, Alan Bruce, Jr.	I.E.-June'49	Westfield, N.J.
Connelly, William Joseph	Bus.-Feb.'51	North Tarrytown, N.Y
Conner, Earle Hunter, Jr.	E.E.-June'49	Camp Hill
Conner, Michael Robert	Met.E.-June'51	Lebanon
Connolly, Thomas Robert	C.E.-Feb.'49	Woodbridge, N.J.
Connor, Samuel Irvin	Arts-June'49	Bethlehem
Connor, Thomas David	Arts-June'52	Bethlehem
Conover, George Roger	M.E.-June'50	South Orange, N.J.
Conrad, Robert Walter	E.E.-June'50	Atlantic City, N.J.
Contey, Frank Anthony III	Bus.-Feb.'49	Jersey City, N.J.
Conway, Harold Edward	Bus.-June'50	Freeport, N.Y.
Cook, Richard Henry	M.E.-June'49	Woodbury, N.J.
Cooke, Frank Henry, Jr.	Bus.-June'49	Havertown
Coombs, William Alderman	I.E.-Feb.'50	Salem, N.J.
Cooper, Donald Francisco	Bus.-June'50	Short Hills, N.J.
Cooper, Donald Telfer, Jr.	M.E.-Feb.'52	Roselle, N.J.
Cooper, John Coleman	Chem.-Feb.'50	Coraopolis
Cordier, George Harold	Ch.E.-June'51	Haworth, N.J.
Cordova, Bradford Charles	Arts-June'52	Garden City, N.Y.
Cornelius, William Albert III	Arts-June'51	Beaver

Cornish, Ralph Edward, Jr.	Bus.-June'51	Greensburg
Cornman, Richard Weber	Ch.E.-June'52	Bethlehem
Cornog, Elwood Carr	Arts-June'50	Summit, N.J.
Corriston, Winfield Ferguson	M.E.-June'49	Barrington, N.J.
Corson, James Allan	M.E.-Feb.'52	South Orange, N.J.
Corson, Osman Myron, Jr.	Ch.E.-June'51	Cape May Court House, N.J.
Cosgrove, John Casey	M.E.-June'51	Pittsburgh
Cosgrove, Mark	Bus.-June'50	Pittsburgh
Couch, Marion Frank	Met.E.-June'49	Catoosa, Okla.
Coughlin, John Jerome	Arts-Feb.'51	Easton
Courtney, Robert William	Bus.-June'50	Westfield, N.J.
Cousins, Robert Henry	C.E.-June'51	Nutley, N.J.
Covey, James Hunt	Arts-June'52	Bellefonte
Cowin, Paul Frederick	Bus.-Feb.'49	Bethlehem
Craig, Hugh	Arts-June'51	Chatham, N.J.
Cram, Michael John	Ch.E.-Feb.'51	Atlanta, Ga.
Craver, John Stone	Bus.-June'50	Honesdale
Crawford, James William	Arts-Feb.'51	Catasauqua
Crehore, William Williams III	M.E.-Feb.'51	Syosset, N.Y.
Creighton, Joseph Fisher	Bus.-June'52	Jenkintown
Cressman, Mark Edgar	Bus.-Feb.'49	Allentown
Cressman, Robert Charles	E.E.-June'50	Bethlehem
Crislip, Joseph Sharps	Bus.-June'52	Akron, Ohio
Cristy, Albert Bowman	M.E.-June'50	Honolulu, T.H.
Crofton, Harry Joseph, Jr.	Arts-June'50	Garden City, N.Y.
Crooks, John Raymond	Ch.E.-June'49	Bethlehem
Cross, James Frederick	Ch.E.-June'51	Clifton, N.J.
Crouse, George William III	Bus.-June'52	Akron, Ohio
Cubberley, Calvin Paul	E.E.-June'49	Yardville Heights, N.J.
Cuff, William Joseph	Bus.-June'50	Elizabeth, N.J.
Cullen, John Darby	Ch.E.-Feb.'49	Kennett Square
Culp, Charles Richard	E.P.-June'49	Gettysburg
Culp, Neil Joseph	Chem.-June'52	Moorestown, N.J.
Cummings, David Triplett	Bus.-Feb.'50	Beacon, N.Y.
Cummings, John Daly	Bus.-June'50	Bethlehem
Cummings, Leon Erwin	Bus.-June'50	Bethlehem
Cummins, Frank Michael	C.E.-June'51	Pompton Lakes, N.J.
Cunningham, Robert Thomas	Bus.-June'49	Whitestone, N.Y.
Curtis, Robert Buchanan	M.E.-June'51	Staten Island, N.Y.
Curtis, Thomas Asten	Bus.-June'51	Rockville Centre, N.Y.
Cusick, John Henry, Jr.	I.E.-June'50	Glen Ridge, N.J.
Czepyha, Chester George Reinhold	E.E.-Feb.'50	New Brunswick, N.J.

Daggett, Richard Lewis	Bus.-June'52	Bradford
Dahl, Karl Ludwig	C.E.-June'51	Harrisburg
Dalton, John Raymond	Met.E.-June'52	Latrobe
Damico, Frank Albert	Ch.E.-June'51	West Reading
Danes, Edward Nelson	Chem.-June'49	Rockville Centre, N.Y.
Daniels, Charles Hugh	I.E.-June'52	Wilmington, Del.
Daniels, Rodger Lee	Arts-June'50	Buck Hill Falls
Danielson, Robert Justa	Bus.-Feb.'51	Bethlehem
Dann, Edward Webster	I.E.-June'52	Buffalo, N.Y.
Danner, John Russell	Arts-June'52	Hazleton

Danner, Wilson Elmer	Chem.-Feb.'52	Easton
D'Antonio, Mario Raphael	Arts-June'50	Trenton, N.J.
Daub, Victor Rudolph	Arts-June'50	Kennett Square
Davenport, Albert Charles	Bus.-June'51	Albany, N.Y.
Davidheiser, Edward William	Arts-June'51	Philadelphia
Davies, Robert William	Met.E.-June'51	West Catasauqua
Davis, Frederick Steward	Bus.-June'52	Philadelphia
Davis, George Oliver, Jr.	Bus.-June'52	Haddon Heights, N.J.
Davis, Harry Williams	Bus.-Feb.'49	Lehighton
Davis, Richard Cameron	M.E.-Feb.'49	Freeport, N.Y.
Davis, Stanton Hoffman	Arts-Feb.'50	Plainfield, N.J.
Davis, Thomas Edward	E.M.-June'49	Nanticoke
Davis, Thomas Raymond	C.E.-June'52	Kimberton
Davis, Walter Harry	E.M.-June'51	Chester
Davis, William Schaff III	Arts-June'51	Skokie, Ill.
Davy, Elvin Bross, Jr.	Ch.E.-June'49	East Orange, N.J.
Dawley, Webster	M.E.-June'49	Plainfield, N.J.
Dawson, Clifford Henry	Bus.-June'50	Chevy Chase, Md.
Day, Charles Burton	I.E.-June'51	Westwood, N.J.
Dayton, Douglas Michel	E.E.-June'49	Plandome, N.Y.
Deal, Joseph McClellan	I.E.-Feb.'51	Trenton, N.J.
Dealaman, Albert Smith	Arts-Feb.'52	Plainfield, N.J.
Dean, David	Arts-Feb.'49	North Branch, N.J.
Dearden, John Rogers	Met.E.-June'52	Jenkintown
Dearden, William Richard	Bus.-June'50	Brooklyn, N.Y.
DeCamp, Jack Marvin	Bus.-June'50	Verona, N.J.
DeCamp, Stuart Petley, Jr.	Ch.E.-June'52	Short Hills, N.J.
Decker, Erwin Louis	M.E.-Feb.'49	Allentown
Decker, Robert Alan	Arts-June'52	Johnson City, N.Y.
DeCrosta, Thomas William	Arts-June'50	Bethlehem
Deemer, Philip Ramsay, Jr.	M.E.-June'50	Bethlehem
Deffaa, Louis Philip	Bus.-June'49	Larchmont, N.Y.
Degler, David Donald	Arts-June'50	Reading
DeGraaf, David Allen	E.P.-June'52	Glen Rock, N.J.
DeHoff, Richard Samuel	Ch.E.-June'49	Flemington, N.J.
Deibert, Thomas William	Bus.-June'52	Northampton
Deisher, John Carroll, Jr.	I.E.-June'50	Royersford
DeLang, James Joseph	I.E.-June'49	Buffalo, N.Y.
DeLorenzo, Donald Peter	Ch.E.-June'52	Brooklyn, N.Y.
DeMeo, Louis James	M.E.-Feb.'49	Buffalo, N.Y.
DeMott, Alfred Eckman	M.E.-Feb.'49	Allentown
Dempsey, William Henry	I.E.-June'50	South Orange, N.J.
Denham, Daniel Eugene, Jr.	Bus.-Feb.'49	Glenbrook, Conn.
Dennis, Donald Munroe	Arts-June'50	Upper Montclair, N.J.
DePaoli, Henry	I.E.-June'49	Palisade, N.J.
Derr, Donald Bruce	E.E.-June'49	Clifton, N.J.
Deschler, Ralph Edwin	Bus.-Feb.'52	Bethlehem
Desnoyers, Paul Jacque	Ch.E.-June'51	North Plainfield, N.J.
DeWitt, Stewart Henderson	E.E.-June'51	Philadelphia
Dexter, Frederick Vincent, Jr.	Bus.-June'49	Hohokus, N.J.
Diacogiannis, Robert Nick	Bus.-June'49	Freemansburg
Diaz, John Andrew	Chem.-June'52	Freeland
Dickert, Charles Theodore	Ch.E.-Feb.'51	Bethlehem
Dickey, David Errickson	E.E.-June'51	Princeton, N.J.
Dickson, Richard Benedict	Bus.-June'50	Orange, N.J.

Diehl, Alfred Charles	Ch.E.-Feb.'50	Emmaus
Diehl, Donald Nonnemaker	M.E.-June'49	Bethlehem
Diehl, Floyd William, Jr.	Arts-Feb.'50	Hellertown
Diehl, William Edward	C.E.-June'49	Allentown
Diener, John Peter	E.P.-June'52	Tuckahoe, N.Y.
Dimmick, Leonard Ray	Bus.-Feb.'50	Bethlehem
Dimmig, Thomas James	Bus.-Feb.'52	Lansdowne
Dinger, Frederick Randolph	M.E.-June'52	Vienna, N.J.
Dinsmore, George Anson	G.C.D.	Whitingham, Vt.
Dinstel, Woodrow Lejune	E.M.-June'51	Irvington, N.J.
Disbrow, Richard Edwin	E.E.-June'52	South Orange, N.J.
DiSpirito, Vincent Joseph	Bus.-June'49	Freeland
Ditterline, Roy Edwin, Jr.	M.E.-June'49	Bethlehem
Dittmar, William Charles	Arts-Feb.'50	Annville
Doberstein, William Stephen	E.E.-Feb.'51	Sweet Valley
Doernbach, Robert Chris	Bus.-June'52	Philadelphia
Dolbeare, John Homer	Bus.-June'50	New Canton, Ill.
Dolby, Leonard, Jr.	Met.E.-June'50	Clarion
Donahue, Joseph Andrew	I.E.-Feb.'49	Garden City, N.Y.
Donaldson, Frederick Russell	Ch.E.-Feb.'49	Scranton
Donatelli, Philip Anthony, Jr.	M.E.-June'51	Ardmore
Doney, Alfred Thomas	I.E.-Feb.'52	Pen Argyl
Donlon, Francis Michael, Jr.	Bus.-June'51	East Orange, N.J.
Doran, John Joseph	Bus.-June'49	Greenwich, Conn.
Dorang, Robert Paul	Arts-June'49	Wilkes-Barre
Dorman, William Henry	E.P.-Feb.'50	Corning, N.Y.
Dorsey, William George	M.E.-Feb.'50	Dover, N.J.
Doster, Richard Walper	Bus.-Feb.'50	Bethlehem
Dotterer, Scott	Met.E.-June'52	Easton
Doty, C. Howard	I.E.-June'52	Hawthorne, N.Y.
Doubleday, James Alfred	Arts-June'52	Pittsburgh
Dougherty, John Joseph	Arts-June'50	Brooklyn, N.Y.
Dougherty, William John	Ch.E.-June'49	Scranton
Douty, Richard Thomas	C.E.-June'52	Harrisburg
Dowdell, Thomas deWindt	M.E.-June'51	Lewisburg
Dowling, Joseph Harry	Arts-June'50	Pittsburgh
Dowling, Vincent John	I.E.-June'49	West Hartford, Conn.
Downing, Joseph Herbert	Arts-June'50	Bethlehem
Downs, George William	I.E.-June'50	Fairfield, Conn.
Downs, Richard Elwood	Bus.-Feb.'49	Woodbury, N.J.
Doyle, James Sherman, Jr.	Bus.-June'51	Bronxville, N.Y.
Doyne, Richard Frank	Ch.E.-June'51	Larchmont, N.Y.
Drack, Donald Reno	Bus.-June'51	Teaneck, N.J.
Drack, Robert John	Bus.-Feb.'50	Teaneck, N.J.
Drake, Robert Edward	Bus.-June'51	Fords, N.J.
Drechsel, Heinz Rudolph	M.E.-Feb.'50	Washington, N.J.
Dreisbach, Edward Arthur	E.E.-June'50	West Pittston
Drever, Horace Barraclough	Met.E.-June'52	Jenkintown
Dreyfuss, Barney	Bus.-June'51	Bethesda, Md.
Driscoll, William Vincent	Bus.-June'50	Larchmont, N.Y.
Driver, Garston Wallace, Jr.	Arts-June'49	Hellertown
Dronenburg, Herbert Frisbee	Bus.-June'50	Northampton
Druschel, Edward Francis	E.E.-June'51	Birdsboro
Dublinski, John Frank	M.E.-June'52	Hazleton
DuBois, Arthur Frederick	Arts-June'50	Coudersport

Dudley, Robert Bruce	Met.E.-June'51	Syracuse, N.Y.
Duffy, Stephen Peter, Jr.	Arts-June'51	Minneapolis, Minn.
Dugan, Charles Michael	Bus.-June'51	Fullerton
Dugan, Edward Joseph	I.E.-Feb.'49	Bethlehem
Duke, George Melville	Bus.-June'49	Lebanon
Dulligan, William	Met.E.-June'51	Lowell, Mass.
Dumont, Charles Walter III	Bus.-June'52	Bedford Village, N.Y.
Dunbar, Douglas MacDonald, Jr.	E.M.-June'50	West Nyack, N.Y.
Dunlevy, Charles Mullen	Ch.E.-June'51	Mount Vernon, N.Y.
Dunn, Joseph Michael	M.E.-June'49	Millburn, N.J.
Dunn, Richard Stanley	Met.E.-June'51	Elmira, N.Y.
Dunning, John Barnard	Bus.-June'49	Westtown
Dunstan, Frank Mitchell	Bus.-June'49	Bethlehem
Durrell, Charles Roberts	E.E.-June'52	Harmon, N.Y.
Dutton, William Glenn	Bus.-June'51	Allentown
Duys, David Ford	Bus.-June'52	Oyster Bay, N.Y.
Dwyer, Arthur Charles	Bus.-June'51	Paterson, N.J.
Dyche, James Ellison	Bus.-June'52	Packanack Lake, N.J.
Dyer, Robert Logan	I.E.-Feb.'49	Philadelphia
D'Zamba, Samuel David	Met.E.-June'51	Uniontown

Eagleson, Peter Sturges	C.E.-Feb.'49	Wyncote
Eagleson, William Boal, Jr.	Bus.-June'49	Wyncote
Eakin, George Stamm	C.E.-June'52	Allison Park
Eastburn, Albert William, Jr.	E.E.-Feb.'51	Hoboken, N.J.
Eaton, James Ellery	Ch.E.-Feb.'50	Bethlehem
Eckert, Russell William	E.E.-Feb.'50	Hellertown
Economy, Constantine Frank	M.E.-June'52	Bethlehem
Edelblute, Thomas Hastings, Jr.	Arts-June'51	Reynoldsville
Edelman, David Lawrence	Arts-June'49	Cementon
Edelstein, George Little	Bus.-June'52	Tamaqua
Edris, Paul Richard	M.E.-June'49	Lebanon
Edson, Lawrence Dunbar, Jr.	Bus.-June'51	Cynwyd
Edwards, Dan Jerry	Ch.E.-June'51	Pen Argyl
Edwards, Frank Leslie Pinkham	C.E.-June'49	Library
Egan, John Edward II	I.E.-June'50	Elkins Park
Egge, Rodger Stuart	E.E.-June'49	Allentown
Ehlers, Byron Davis, Jr.	I.E.-Feb.'51	Maplewood, N.J.
Ehrsam, Otto, Jr.	Met.E.-June'51	Bronx, N.Y.
Eichhorn, Noel David	Arts-June'52	Williston Park, N.Y.
Eisele, Wallace Christian	I.E.-Feb.'49	Mineola, N.Y.
Eisenhauer, Harold Albert	I.E.-June'50	Bethlehem
Eisinger, Frank Paul	Bus.-June'49	Hastings-On-Hudson, N.Y.
Ela, Alfred Thompson	E.E.-June'51	Wollaston, Mass.
Eldridge, Donald Francis	E.E.-June'49	Nutley, N.J.
Eldridge, Elwood Clark	M.E.-June'51	Wenonah, N.J.
Eliezer, David Frank	Arts-June'49	Paterson, N.J.
Elliott, William Henry, Jr.	I.E.-June'49	Cockeysville, Md.
Ellis, Robert	E.E.-June'52	Upper Darby
Ellison, Dean Brackett	I.E.-Feb.'49	Granby, Mass.
Elm, Gerhard William	Bus.-June'49	Palmerton
Elrick, Richard McElvain II	M.E.-June'51	York
Embrey, Nelson Scales	Ch.E.-June'51	Bethesda, Md.
Emmons, George Nicholas	M.E.-June'51	Orange, N.J.

Emrey, Richard Clay	I.E.-June'50	Bethlehem
Engelhardt, Theodore Charles, Jr.	Bus.-June'49	Wyomissing
Engle, James Linton	E.E.-June'51	Haddonfield, N.J.
Engler, Charles Henry	I.E.-June'49	South Orange, N.J.
Englesson, George John	Arts-June'50	Bethlehem
Enright, Henry Joseph	Bus.-June'51	Bethlehem
Enterline, Robert Rhoades	M.E.-June'49	Ashland
Entwisle, David Compton	Bus.-Feb.'50	Maplewood, N.J.
Eppel, William Robert	Bus.-June'52	South Orange, N.J.
Epstein, Gilbert Howard	Ch.E.-June'52	Bethlehem
Epstein, Ira G.	Ch.E.-June'52	Long Branch, N.J.
Erdle, Louis Vincent	M.E.-June'50	Bethlehem
Erdman, George Emery	E.M.-Feb.'51	Shamokin
Erdman, James Edwin	Arts-June'52	Shamokin
Erdman, William Charles	I.E.-June'52	Pittsburgh
Erikson, Edwin John	C.E.-June'49	North Bellmore, N.Y.
Erikson, Eric Russell	Bus.-June'50	North Bellmore, N.Y.
Ernst, Charles William	Bus.-Feb.'51	Bogota, N.J.
Ernst, Edwin Paul	Bus.-June'49	Philadelphia
Ervin, William Hackman	Arts-June'51	Bath
Eshbach, Russel Elwood	M.E.-June'49	Reading
Esherick, George Thompson	I.E.-June'51	Cynwyd
Essig, Harold George	Arts-June'50	Merrick, N.Y.
Estler, Orville Leland	I.E.-Feb.'51	Bethlehem
Ettelman, David Joshua	E.E.-June'50	New York, N.Y.
Eu, Alexander Keng-Kee	I.E.-Feb.'50	Secaucus, N.J.
Evans, Malcolm Bruce	Bus.-June'50	Bethlehem
Evans, Paul Robert	Bus.-Feb.'49	Catasauqua
Evans, Richard Laighton	Ch.E.-June'52	Johnstown
Evans, William Charles	Ch.E.-June'51	Ventnor City, N.J.
Evon, Joseph	E.E.-June'49	Scranton

Faber, Robert Gerson	Bus.-June'51	Trenton, N.J.
Fahringer, Russell Kenneth	M.E.-Feb.'50	Allentown
Fair, Frederick Maul	Arts-June'51	Pittsburgh
Falcone, Philip Francis	E.E.-June'52	Bethlehem
Falk, Harvey Alfred, Jr.	E.E.-June'52	Hokendauqua
Faller, William James	E.E.-Feb.'51	Oil City
Farny, James Francis	Ch.E.-June'50	Allentown
Farrall, Richard Joseph	Arts-June'50	Bethlehem
Farrell, Richard Earl	Bus.-Feb.'49	Clairton
Faul, Terence Gerhart	C.E.-Feb.'50	Quakertown
Faust, Albert Charles	E.E.-June'49	Bethlehem
Fay, Robert Bernard	Bus.-June'50	Pittsburgh
Fear, John Morgan	Ch.E.-June'52	Pittston
Fegely, Franklin John	Bus.-June'50	Allentown
Fegely, Wayne David	E.E.-June'49	Mertztown
Fegley, Paul Gerald, Jr.	E.E.-June'50	Orwigsburg
Fehnel, Richard Walter	M.E.-June'51	Bethlehem
Feickert, Alfred Charles	Arts-June'52	Summit, N.J.
Felter, Robert Rockwell	E.P.-June'52	New York, N.Y.
Fenger, John Berg	Arts-June'49	Hamburg, N.Y.
Fenger, Peter Forsom	M.E.-June'49	Hamburg, N.Y.
Fennessy, Donald Thomas	E.E.-Feb.'51	West Orange, N.J.
Fennick, Adolph Francis	Arts-June'51	Wilkes-Barre

Fenol, Michael John	Ch.E.-Feb.'51	Bethlehem
Fenstermacher, Richard Kocher	Ch.E.-Feb.'49	Allentown
Ferber, Frederick George	Arts-June'50	Scranton
Ferguson, Paul Bruce	I.E.-June'49	Philadelphia
Ferrara, Thomas Peter	C.E.-June'52	Hewlett, N.Y.
Ferree, Kenneth Elwood	E.E.-June'49	York
Ferris, Arthur Laurence	E.E.-Feb.'52	Sayre
Ferrise, Louis Joseph	Ch.E.-June'51	Brooklyn, N.Y.
Fett, Paul Henry	E.E.-June'51	Reading
Feuerbach, George Joseph	E.E.-June'52	North Bellmore, N.Y.
Fichter, Frank Charles Paul	E.E.-June'49	Bethlehem
Fickes, Donald Alan	M.E.-June'49	New Cumberland
Fiedler, Edward	C.E.-Feb.'51	Bethlehem
Field, Arthur Wallace	Ch.E.-June'52	Nutley, N.J.
Figueroa, Howard George	Arts-June'52	Rockville Centre, N.Y.
Filaseta, Bartholomew Michael	Arts-June'52	Bethlehem
Filaseta, Pasquale Joseph	E.E.-Feb.'51	Bethlehem
Filipos, Michael	Arts-June'51	Bethlehem
Finan, John Marshall	E.E.-June'51	New York, N.Y.
Finch, George Nelson	Ch.E.-June'50	West Orange, N.J.
Fineberg, Martin Alan	I.E.-Feb.'49	Jersey City, N.J.
Finnegan, Thomas James	Met.E.-June'51	Asbury Park, N.J.
Finney, Gerald Gahr	I.E.-June'52	Cranford, N.J.
Fischer, George Frederick, Jr.	M.E.-Feb.'50	Irvington, N.J.
Fischer, Paul Dietrich	E.M.-Feb.'50	Scarsdale, N.Y.
Fischer, Richard Merwin	I.E.-June'50	Buck Hill Falls
Fischer, Valentine John	Ch.E.-June'51	Rockville Centre, N.Y.
Fisher, Alvin Henry, Jr.	Arts-June'49	Boyertown
Fisher, Donald Robert	E.E.-June'51	Elizabeth, N.J.
Fisher, James Robert	M.E.-Feb.'49	Williamsport
Fisher, Jerome Edward	Bus.-June'51	Wescoesville
Fisher, Neil Allan	E.E.-June'52	Cleveland Heights, Ohio
Fisher, Thomas Quinn	Bus.-June'50	Philadelphia
Fiske, Richard Lewis	M.E.-June'51	Palmerton
Fitzpatrick, Gilbert Lawrence	Bus.-June'52	Tuckahoe, N.Y.
Flanagan, John Jacob	E.E.-June'50	Bethlehem
Flanagan, Joseph Eric	Bus.-June'52	South Orange, N.J.
Fleagle, George Paul	Arts-June'51	Bethlehem
Fleck, George Carl	Bus.-Feb.'52	Elkins Park
Fleck, John George	Arts-June'51	Elkins Park
Fleck, William Pyle	Arts-June'52	Pittsburgh
Fleckenstein, William Owen	E.E.-June'49	Bethlehem
Flecksteiner, John William	Ch.E.-Feb.'50	Bethlehem
Fleischer, Carl William, Jr.	E.P.-June'50	North Bellmore, N.Y.
Flexer, Richard James	Bus.-June'51	Allentown
Flippen, John Philip, Jr.	Bus.-June'49	Pittsburgh
Flores, Carlton Kenneth	Bus.-June'51	Allentown
Flores, Richard Winthrop	Ch.E.-June'50	Upper Darby
Flower, Franklin Bromley	I.E.-Feb.'49	Bayville, N.Y.
Fluharty, David Garrison	Arts-June'52	New Rochelle, N.Y.
Flynn, Robert John	Arts-June'52	Port Washington, N.Y.
Foerster, William	E.E.-June'50	East Paterson, N.J.
Fogelman, Arthur Herbert	E.E.-June'51	Reading
Fogleman, Edgar Lloyd	E.E.-June'52	Altoona

Foltz, William Andrew	M.E.-June'49	Easton
Ford, David Kingsley	Arts-June'49	Shaker Heights, Ohio
Ford, Mark Robert	Arts-June'50	Bethlehem
Ford, Richard Nickerson	C.E.-June'49	Bethlehem
Forensky, George Joseph	M.E.-June'50	Palmerton
Fornoff, David Arthur	Ch.E.-June'50	Bloomfield, N.J.
Forsythe, Marvin Perry	I.E.-Feb.'49	Kenvil, N.J.
Foster, Charles Arthur, Jr.	Arts-Feb.'50	Philadelphia
Foster, Harold Marvin	Ch.E.-Feb.'50	Fair Lawn, N.J.
Foster, John Carroll	E.M.-Feb.'52	Easton
Foster, Theodore II	Bus.-Feb.'50	Utica, N.Y.
Foster, Walter Jacob	Arts-June'52	Brooklyn, N.Y.
Fountain, Robert Fielder III	I.E.-June'52	Allenhurst, N.J.
Foust, John Haring	Ch.E.-June'49	Wilkes-Barre
Fox, William Thomas	Bus.-June'50	Valley Stream, N.Y.
Frager, Victor Irving	Bus.-Feb.'49	Newburgh, N.Y.
Francis, William George	M.E.-June'50	Bloomfield, N.J.
Frank, Richard Barry	Bus.-June'52	New York, N.Y.
Frankenfield, William Daniel	E.M.-June'52	Coopersburg
Frankhouser, Homer Sheldon, Jr.	C.E.-June'52	Reading
Frankle, Jerome Harold, Jr.	M.E.-June'50	Youngstown, Ohio
Frantz, Jacob John	E.E.-June'49	Reading
Franz, Richard Noel	I.E.-June'49	Elkins Park
Frederick, John Howard	Chem.-June'51	East Stroudsburg
Freeh, John Joseph	E.E.-June'51	Pleasant Valley
Freeman, John Ripley III	Bus.-June'50	Middlebury, Conn.
Freeman, John Roland	Bus.-June'51	Baldwin, N.Y.
French, Howard William	Bus.-June'50	Nanticoke
French, Richard Newman	E.M.-June'52	Holmdel, N.J.
Frensky, Carl Stephen	Bus.-June'50	Allentown
Freund, Clifford Calvin	Met.E.-Feb.'50	Succasunna, N.J.
Frey, Philip Wayne	C.E.-Feb.'52	Short Hills, N.J.
Freyman, William Charles	Ch.E.-June'51	Allentown
Frick, Edmund Trout	Met.E.-June'49	Pottstown
Friebus, Theodore Stockbridge	E.P.-June'52	Montclair, N.J.
Friedberg, Clayton Allan	Bus.-June'51	Bridgeport, Conn.
Friedman, Bernard	M.E.-June'49	Newark, N.J.
Friedman, Kenneth Evan	Bus.-June'51	Larchmont, N.Y.
Frischkorn, Frank Jennings	M.E.-Feb.'49	Detroit, Mich.
Frishberg, Newton	Arts-June'50	Bethlehem
Fritchman, Edward Reeve	Arts-June'49	New York, N.Y.
Fritchman, Theodore Truman	M.E.-June'49	Hellertown
Fritz, Ralph Canfield	Ch.E.-June'49	Norristown
Fritzsche, Herbert Judson	Arts-June'50	West Trenton, N.J.
Froggartt, John Wesley	E.E.-June'52	Philadelphia
Frost, Howard, Jr.	Bus.-June'52	Allentown
Fry, Frederick William	M.E.-June'50	Reading
Fry, William Albert	E.E.-June'52	Ridgewood, N.J.
Fryberger, Charles Theodore II	I.E.-June'51	Philadelphia
Frymoyer, Harry Eugene	Bus.-June'50	Shillington
Fuchs, Frederick Charles	C.E.-Feb.'52	Wynnewood
Fuehrer, Richard Clarence	Bus.-Feb.'49	Swansea, Mass.
Fuller, Harold Bentley	I.E.-June'50	Norwich, N.Y.
Fuller, Robert Merrill	Bus.-June'49	Hellertown
Fulleylove, James Shirley	E.P.-June'50	Port Washington, N.Y.

Fusco, Joseph John	Ch.E.-June'52	Drexel Hill
Gabel, Austin	Arts-June'49	West Orange, N.J.
Gabriel, Francis Xavier	G.C.D.	Hellertown
Gabriel, Louis Joseph	Arts-June'51	Kennett Square
Gabriel, Richard Frank	Bus.-June'51	Valley Stream, N.Y.
Gabuzda, Thomas George	Arts-June'51	Freeland
Gackenbach, Russell Edgar	Met.E.-June'50	Allentown
Gaines, Wilbur LeRoy	Arts-June'52	Bayside, N.Y.
Galbiati, Donald Vincent	Met.E.-Feb.'50	Hazleton
Gale, Albert Andrew	E.E.-June'52	Worcester, Mass.
Gallagher, Eugene Bennett	Arts-June'49	Lancaster
Gallagher, William Stewart	Arts-June'51	Johnstown
Galow, George Emerson	Arts-Feb.'49	Mount Carmel
Galvin, John Joseph	Bus.-Feb.'51	Grosse Pointe, Mich.
Gammache, Richard Joseph	Bus.-Feb.'50	Bethlehem
Gandolfi, Gino Albert	M.E.-June'49	Folsom, N.J.
Ganter, George Edwin	Ch.E.-June'51	Staten Island, N.Y.
Garbe, William Frederick	E.P.-June'52	Allentown
Garden, David Alexander	Met.E.-Feb.'52	St. Helena, Calif.
Gardiner, Edward William	E.E.-Feb.'50	Fair Lawn, N.J.
Gardiner, Joseph Wilkins III	Bus.-June'52	Wyncote
Gardner, Robert Bigelow	M.E.-June'51	Westfield, N.J.
Gardner, William Albert	C.E.-June'52	Allentown
Garland, Carl Sterling	Arts-June'50	Coopersburg
Garner, Robert Wright	M.E.-June'52	Washington, D. C.
Garrett, William Starling, Jr.	Arts-June'51	Roanoke, Va.
Garrity, Robert Edwin, Jr.	Bus.-June'51	Newton, Mass.
Garthwaite, David Sawyer	I.E.-June'51	Rahway, N.J.
Gartside, Frederick Noble	M.E.-June'52	South Orange, N.J.
Gasdaska, Richard John	Arts-June'50	Bethlehem
Gastmeyer, Robert William, Jr.	C.E.-June'49	Mount Lebanon
Gaston, Edgar Greenbank	Ch.E.-June'49	Somerville, N.J.
Gates, Harris Reynolds	Bus.-Feb.'51	Washington, D. C.
Gates, Henry Stillman	Chem.-June'51	Sharon
Gates, Milbourne Thornton	M.E.-June'49	Port Norris, N.J.
Gattorna, Benedict Francis, Jr.	Arts-June'52	Allentown
Geasey, Robert Edward	E.E.-June'50	West Hartford, Conn.
Gebhard, John Charles, Jr.	Ch.E.-Feb.'49	Great Lakes, Ill.
Gebhardt, Gordon Jay	Bus.-June'50	Erie
Gebhardt, Neil Humphrey	I.E.-June'49	Erie
Gedney, Jack Ryder	M.E.-Feb.'50	Mamaroneck, N.Y.
Gehlmeyer, Robert Val	Arts-June'51	Roslyn Heights, N.Y
Gehman, Paul Robert	E.E.-Feb.'52	Lansdale
Gehret, Edward Fayette, Jr.	M.E.-June'52	Centreville, Del.
Geiger, Richard Harry	E.P.-June'50	Flushing, N.Y.
Geiger, Robert Raymond	Arts-June'50	Flushing, N.Y.
Geis, Robert Andrew	I.E.-Feb.'50	Johnstown
Geisler, Philip Howard	Arts-Feb.'50	Philadelphia
Gellatly, Stafford Reeves	E.M.-June'52	Fairfield, Conn.
Gentzlinger, William Henry	Arts-June'52	New York, N.Y.
Geoly, Charles	M.E.-Feb.'51	Flushing, N.Y.
Georgaklis, Arthur George	Bus.-June'51	Brookline, Mass.
George, James Calvin	E.M.-June'52	Tarentum
Georgiadis, John Franklin	Met.E.-June'50	Bethlehem

Geosits, Frank Julius	C.E.-Feb.'51	Northampton
Geraci, Frederic Entress	Bus.-June'51	Dobbs Ferry, N.Y.
Gerhard, Henry Edward	Arts-June'50	Allentown
Gerhard, Paul Gordon	E.P.-Feb.'50	Palmerton
Gerrard, Jack Walker	M.E.-June'51	Buffalo, N.Y.
Gerstenberger, Henry Leigh, Jr.	I.E.-Feb.'51	Roselle, N.J.
Gesner, William Joseph	Bus.-June'52	Beach Haven, N.J.
Geyer, John Henry	Met.E.-June'49	Philadelphia
Geyer, Robert Taylor	Bus.-Feb.'50	Scarsdale, N.Y.
Gibb, John	E.E.-June'51	Elizabeth, N.J.
Gibble, Earnest Earl	Bus.-June'52	Lebanon
Gibbons, John Patrick	Bus.-June'49	Bethlehem
Gibson, Andrew Gillan	Ch.E.-June'51	Stratford, Conn.
Gigon, George Roland	Ch.E.-June'52	River Edge Manor, N.J.
Gigon, Richard Maurice	C.E.-June'52	River Edge Manor, N.J.
Gilbert, Gerald Frederick, Jr.	Ch.E.-Feb.'51	West Reading
Gildersleeve, David Hamilton	Arts-June'52	Cranford, N.J.
Giles, Richard Wescoe	Bus.-June'52	Bethlehem
Giles, William Francis	M.E.-June'49	Bethlehem
Gill, Charles Wilson	M.E.-June'52	Bloomfield, N.J.
Gill, James Lawrence	Arts-June'51	Hillside, N.J.
Gilley, Joseph Frederick III	Met.E.-Feb.'50	Bethlehem
Gillinder, Edwin Holmes	Bus.-June'51	Port Jervis, N.Y.
Gillinder, Joseph Fletcher	Bus.-Feb.'49	Port Jervis, N.Y.
Gilpin, Ernest Grant	Arts-June'49	Paradise
Gilson, Kenneth Gwyn	Arts-June'52	Glen Ridge, N.J.
Ginder, Mark Edwin	E.E.-June'51	Allentown
Gladstone, William Louis	Bus.-June'52	Brooklyn, N.Y.
Glander, Richard Alfred	E.M.-June'52	Blairstown, N.J.
Glazebrook, James McClain	C.E.-June'50	Los Angeles, Calif.
Glimm, William Frederick, Jr.	Ch.E.-June'52	Westfield, N.J.
Glina, John	Bus.-June'49	Bethlehem
Glossbrenner, Alfred Bertram	Bus.-June'49	Youngstown, Ohio
Goebel, George Wesley	E.E.-June'50	Philadelphia
Goeller, Robert Arthur, Jr.	Bus.-June'49	Scarsdale, N.Y.
Goepert, Albert Richard	E.M.-June'49	Freeland
Goetze, Alan Burton	E.E.-June'52	Westfield, N.J.
Gold, John DeHuff	Met.E.-June'49	Steubenville, Ohio
Gold, Richard George	Ch.E.-June'49	Bethlehem
Goldberg, Arthur Webster	Arts-June'52	New York, N.Y.
Goldberg, Nolan Metz	Bus.-June'51	Jenkintown
Golden, Charles Joseph	Arts-June'50	West Pittston
Goldsmith, Richard Lester	Bus.-June'51	Philadelphia
Gonczlik, Ernest John	M.E.-June'52	Rahway, N.J.
Goodale, John Henry	Ch.E.-Feb.'50	Trenton, N.J.
Goodhart, Jay Hughes	Bus.-June'49	Irwin
Goodman, Charles	Bus.-June'50	Philadelphia
Goodman, Richard Lowell	Bus.-June'52	Bethlehem
Gorcsan, John, Jr.	M.E.-June'49	Bethlehem
Gordon, Arthur Thomas	E.E.-June'50	Coopersburg
Gordon, Carl Greenwald	Bus.-June'51	New Rochelle, N.Y.
Gordon, Douglas Herbert	C.E.-June'49	Bethlehem
Gordon, Hugh James	E.E.-June'52	Malverne, N.Y.
Gordon, Richard	Bus.-June'52	New Rochelle, N.Y.
Goss, Donald Young	I.E.-June'52	Waterbury, Conn.

Gotwalt, Robert Henry	Bus.-Feb.'50	Bethlehem
Gould, Richard Henry	M.E.-June'52	Ridgewood, N.J.
Gould, Wesley Edward, Jr.	Chem.-Feb.'49	New York, N.Y.
Gozzard, Robert	Bus.-June'50	Hellertown
Graber, Dallas Schultz	Arts-June'51	East Greenville
Graeber, Conrad Raymond, Jr.	Ch.E.-June'51	Shamokin
Grafton, Frederick Meeker	I.E.-June'50	Bayville, N.Y.
Graham, John Harry	E.E.-June'49	Lansdale
Graham, John Woods	Bus.-June'50	Philadelphia
Graham, Robert William	M.E.-June'49	Merchantville, N.J.
Gratton, Francis Richard	Bus.-June'51	East Rochester, N.Y.
Grauch, John Frank III	E.E.-June'50	Drexel Hill
Grauer, John Vernon, Jr.	Bus.-June'51	Jenkintown
Gravany, James Charles	Bus.-June'52	Keansburg, N.J.
Graver, Malcolm Theodore	C.E.-June'52	Allentown
Greason, Peter Wallace	Bus.-June'51	South Orange, N.J.
Green, Henry Holmes	I.E.-June'51	Hazleton
Greenamoyer, William John	Bus.-Feb.'49	Bethlehem
Greenawald, Ralph Adam	Met.E.-June'50	South Temple
Greenawald, Russell Perkins	Arts-June'49	West Pittston
Greenberg, Jerome	Arts-June'52	Bay Shore, N.Y.
Greene, Garrett Levering	Arts-June'50	Fleetwood
Greene, Omar Vivien, Jr.	Arts-June'51	Fleetwood
Greenough, William Devine	C.E.-June'50	Butler
Grega, George Eugene	I.E.-Feb.'50	Freeland
Grell, Frederick Charles	M.E.-June'49	Brooklyn, N.Y.
Grell, Harry William	M.E.-Feb.'49	Brooklyn, N.Y.
Gretz, Herbert Frank, Jr.	Arts-June'51	Wayne
Gretz, Jay Clark	I.E.-June'49	South Orange, N.J.
Griesemer, Harold Ammarell	M.E.-Feb.'49	Reading
Griffin, David Hancock	Bus.-June'50	Bronxville, N.Y.
Griffith, John W.	I.E.-June'49	Scranton
Grigg, Frederic Clinton	M.E.-June'51	Bordentown, N.J.
Grim, Harold Ray	Ch.E.-Feb.'50	Red Lion
Grim, John Nelson	C.E.-June'52	Dobbs Ferry, N.Y.
Grim, Robert Osborne	C.E.-June'52	Dobbs Ferry, N.Y.
Grimm, Richard Thomas	Ch.E.-Feb.'52	Elizabeth, N.J.
Griwatz, Bernhard Christian Karl	E.E.-June'52	Brooklyn, N.Y.
Groeger, Joseph Herman	I.E.-Feb.'50	Bethlehem
Groseclose, Tyler Lee, Jr.	Bus.-June'52	Wynnewood
Grosskettler, John Joseph	M.E.-June'51	Hazleton
Grow, Charles Robert	E.E.-June'51	Shamokin
Gruhn, Donald Mitchell	Bus.-Feb.'49	New York, N.Y.
Grundmann, Arthur	Ch.E.-June'50	Clifton, N.J.
Gudikunst, James Butzer	M.E.-June'50	Ephrata
Gudikunst, Paul Butzer	E.E.-June'50	Ephrata
Guest, Frank John	M.E.-June'49	Chadds Ford
Guggenheim, William Leslie	I.E.-Feb.'49	Jenkintown
Guidon, Peter Thomas	Bus.-June'50	Bethlehem
Gulya, John William	Met.E.-June'50	Bethlehem
Gumble, Harold Arthur	C.E.-June'49	Paupack
Gunn, Thomas Leslie	I.E.-Feb.'50	Picture Rocks
Gunthorpe, Charles Webster	Ch.E.-June'50	Havertown
Gutshall, Frank Bachman	Bus.-June'50	Springtown

Haas, Eugene, Jr.	G.C.D.	Allentown
Haberstroh, John Joseph	Bus.-Feb.'51	New York, N.Y.
Hacik, John, Jr.	Ch.E.-Feb.'50	Garfield, N.J.
Hackett, George Edward	C.E.-June'49	Drexel Hill
Haft, Robert Michael	Arts-June'52	New York, N.Y.
Haftl, Joseph Rudolph	Arts-June'49	Allentown
Hagenbuch, Walter George	Arts-Feb.'50	Bethlehem
Hagey, C. Donald	Arts-June'49	Bethlehem
Hahn, William Fred	I.E.-Feb.'49	Nazareth
Haig, Clifford Wesley, Jr.	Arts-June'50	Lancaster
Haines, Alonzo Floyd	Bus.-June'52	Pittsburgh
Haines, David Earl	Ch.E.-June'51	Elkins Park
Haldeman, George Milton	E.E.-Feb.'50	Schuylkill Haven
Halfacre, George Frederick	Arts-June'49	Palmerton
Halfacre, Robert Ernest	Met.E.-June'50	Palmerton
Hall, Edwin Francis, Jr.	E.E.-June'49	Westfield, N.J.
Hall, George Robert	I.E.-Feb.'49	Arlington, N.J.
Hall, Ray Baker, Jr.	Bus.-June'51	Lancaster
Hallberg, Edwin Harold	E.P.-June'51	River Edge, N.J.
Haller, Ernest Case	Bus.-June'49	Northampton
Halpern, Stephen	Arts-June'50	Brooklyn, N.Y.
Haltenhoff, Charles Edwin	C.E.-June'51	Brooklyn, N.Y.
Hamilton, Edward Showell, Jr.	Arts-Feb.'50	Williamson, W.Va.
Hamilton, William Fitch	Bus.-June'49	Washington, D. C.
Hammer, Richard Lee	Arts-June'52	Bethlehem
Hanby, Kenneth Roger	Ch.E.-June'52	Towson, Md.
Handwerk, Ira Paul	I.E.-June'52	Bethlehem
Handwerk, Russell Frank	Met.E.-June'52	Bethlehem
Hanford, Philip Clark, Jr.	C.E.-June'49	Annville
Hankinson, Kenneth	Bus.-Feb.'50	Pennington, N.J.
Hannan, Robert Munroe	I.E.-June'50	Hackensack, N.J.
Hansen, Nels Robert	Bus.-June'52	Beaver
Hanson, Ellis Milton	I.E.-Feb.'51	Philadelphia
Hanson, John Gustave	Ch.E.-June'52	Wilkes-Barre
Hantz, Benjamin Franklin, Jr.	I.E.-June'49	York
Hanway, Paul Scott, Jr.	Bus.-Feb.'51	Bethlehem
Harcarufka, John Richard	Chem.-June'52	Curwensville
Hardwick, Ambrose Hills, Jr.	Bus.-June'50	Orange, N.J.
Hardwick, William Wheatley	Ch.E.-Feb.'52	Orange, N.J.
Hardy, Charles Henry	Bus.-June'49	Pelham, N.Y.
Harhigh, Emmanuel	E.E.-June'52	Coopersburg
Haring, Richard	M.E.-June'50	Bala-Cynwyd
Harlan, William Knott, Jr.	Arts-Feb.'50	Easton
Harmes, Earl Esmond	M.E.-June'52	Milwaukee, Wis.
Harmon, Bruce Chambers	E.E.-June'49	Cleveland, Ohio
Harmon, Richard Calvin	E.P.-June'52	Livingston, N.J.
Harris, Charles Augustus, Jr.	Bus.-June'49	Harrisburg
Harris, Christopher John	Bus.-Feb.'51	Nutley, N.J.
Harris, Stuart Innes	E.M.-Feb.'51	Katonah, N.Y.
Harris, Thomas Wilson, Jr.	Arts-Feb.'50	Athens
Harrison, Ivan Ralph	Arts-June'52	Brush Valley
Hart, Donald Eugene	Bus.-June'52	Easton
Hart, Richard Leon	E.E.-June'49	Lancaster
Harter, Robert Mack	Bus.-June'49	Westfield, N.Y.
Hartigan, Arthur Matthew	Ch.E.-June'52	Westfield, N.J.

Hartman, David Paul	M.E.-June'50	Pittsburgh
Hartman, Lee William	C.E.-June'49	Quakertown
Hartman, Lester Joseph	E.E.-June'51	Bethlehem
Hartman, Ralph Leroy, Jr.	C.E.-June'51	Fair Lawn, N.J.
Hartman, Ray Howard	Ch.E.-June'50	Allentown
Hartogensis, Steven	E.E.-June'52	Ridgewood, N.J.
Hartzell, William George	E.E.-Feb.'51	Reading
Hastey, Kenneth Warren	Ch.E.-June'49	East Rutherford, N.J.
Hatfield, John Gross	M.E.-June'52	Allentown
Hattal, Howard Edward	E.E.-Feb.'50	Norristown
Haubenstock, Alan Sidney	Bus.-Feb.'49	Paterson, N.J.
Haught, Thomas Lloyd	Bus.-June'52	Erie
Haupt, Edward Chancellor	Arts-June'51	Highland Park, Ill.
Hauser, Lee Raymond	C.E.-June'50	Drexel Hill
Hauze, William John, Jr.	E.E.-Feb.'50	Bethlehem
Hayward, Clyde Ross, Jr.	Bus.-Feb.'49	Aliquippa
Hazelwood, James Malcolm	I.E.-Feb.'52	Albany, N.Y.
Head, John James	I.E.-June'49	West Lawn
Heavener, Arthur Augustus	M.E.-June'50	Easton
Heck, Guy Oswald	Arts-June'50	Bethlehem
Heeb, Robert Hadden	Bus.-June'49	Montville, N.J.
Heffner, Robert Edwin	I.E.-Feb.'51	Hillside, N.J.
Heider, Richard Campbell	Ch.E.-June'49	Bethlehem
Heim, Robert Philip	Arts-June'52	Scranton
Heine, Theodore David	M.E.-June'51	Lehighton
Heineman, Carl Richmond	Ch.E.-June'49	Absecon, N.J.
Heintzelman, Warren Calvin	I.E.-June'49	Bowmanstown
Heiser, Robert Arthur	M.E.-Feb.'49	Reading
Heisler, Edward Anthony, Jr.	Arts-June'49	Bethlehem
Heist, John Cyrus	Ch.E.-June'50	Northampton
Helle, Johannes Ferdinand	Ch.E.-Feb.'51	Cranford, N.J.
Heller, Norman Bernard	Bus.-Feb.'49	New Rochelle, N.Y.
Helms, Franklin Wallace, Jr.	Ch.E.-Feb.'50	Summit, N.J.
Hemion, Malcolm Land	Arts-June'52	Verona, N.J.
Hempstead, William Post	M.E.-June'52	Clifton, N.J.
Hendershot, Lester Kenneth, Jr.	M.E.-June'50	Upper Montclair, N.J.
Henderson, William Ell	M.E.-June'52	Lancaster
Hendrick, Robert Reeve	I.E.-June'49	East Orange, N.J.
Henninger, Milton Charles	Arts-June'49	Allentown
Henrich, Harold John	I.E.-Feb.'50	Hempstead, N.Y.
Henritzy, Paul Albert	Bus.-June'49	Emerald
Henry, Harold George	Bus.-June'50	Neffs
Henry, Merit Richard	Arts-Feb.'50	Bethlehem
Henschel, John, Jr.	Bus.-Feb.'51	Garden City, N.Y.
Herczeg, Louis Stephen	E.P.-June'49	McAdoo
Herman, George Haskell	Bus.-June'49	New York, N.Y.
Herman, James Henry	E.E.-June'52	Brooklyn, N.Y.
Herman, Robert	E.P.-June'50	Plainfield, N.J.
Hernsdorf, Norman Bruno	E.E.-June'52	Clifton, N.J.
Herrick, Neil Roger	Arts-June'52	Great Neck, N.Y.
Herring, Francis Girard	Ch.E.-Feb.'49	Allentown
Hershey, John Raymond, Jr.	Bus.-Feb.'49	Hagerstown, Md.
Herterich, Donald Bruce	Arts-June'52	Tenafly, N.J.
Herty, Charles Holmes III B.S. in Chem., North Carolina	G.C.D.	Bethlehem

Hertzog, Ernest Reuben	E.E.-June'51	Emmaus
Hess, Lawrence Thomas	Arts-June'51	New Tripoli
Hess, Richard Garber	Met.E.-Feb.'50	Lititz
Hess, Richard Gregory	Arts-June'52	Madison, N.J.
Hetzel, George	I.E.-Feb.'52	Pittsburgh
Hewit, Frank Goodfellow	Bus.-Feb.'49	Plainfield, N.J.
Hewit, Oliver Hartley III	Bus.-Feb.'49	Plainfield, N.J.
Heyman, Horace Kerry	Bus.-June'50	Short Hills, N.J.
Heyman, Sam Norton	Bus.-Feb.'51	Brooklyn, N.Y.
Heyman, Sidney Solomon	M.E.-June'49	Woodmere, N.Y.
Heyworth, Emerson Ormerod, Jr.	Bus.-June'49	Mamaroneck, N.Y.
Hicks, Robert Carl	Ch.E.-June'49	Upper Darby
Hiestand, John Harold	Ch.E.-June'51	Harrisburg
Higginson, Edgar Albert	I.E.-June'50	North Bergen, N.J.
Hildebrand, James Edgar	Bus.-Feb.'50	Short Hills, N.J.
Hildenbrandt, Robert George	E.E.-Feb.'50	Pottsville
Hilder, Frederick Asa	I.E.-June'52	Allentown
Hileman, Andrew Robert	E.E.-Feb.'52	Smethport
Hilf, Paul Townsend	Bus.-June'51	Pittsburgh
Hill, Bruce Urton, Jr.	M.E.-June'52	Pittsburgh
Hill, David Bruce	Arts-June'52	Wynnewood
Hill, Robert Boyd	M.E.-June'49	Hamburg, N.Y.
Hillegass, Milton Robert	M.E.-June'52	Red Hill
Hills, Edward Edwards	Bus.-June'50	Norwood, Mass.
Himmelberger, Franklin	E.P.-June'49	Coopersburg
Himmelrich, Samuel Katz	Bus.-June'52	Baltimore, Md.
Hiner, Jerry Gordon	Bus.-June'50	Bronxville, N.Y.
Hinkel, Edward David, Jr.	Met.E.-June'50	Reading
Hinlein, Bruce Milton	Bus.-June'50	Elkins Park
Hinman, Harry Eugene, Jr.	Arts-June'51	Oswego, N.Y.
Hirsch, Herbert Sachs, Jr.	Ch.E.-June'49	South Orange, N.J.
Hirschman, Stephen Douglas	Bus.-June'49	Larchmont, N.Y.
Hlynsky, Alex	Chem.-June'49	Erie
Hoagey, Frank Arthur	Arts-June'52	Bethlehem
Hobby, Edward Kenleigh	Bus.-June'52	Brooklyn, N.Y.
Hoch, Edward Vincent	Arts-Feb.'50	Bethlehem
Hoch, Richard Clark	Chem.-Feb.'51	Nazareth
Hoefler, Raymond Francis	Chem.-June'51	Oak Park, Ill.
Hoffacker, Burnell Eugene	Met.E.-Feb.'50	Pearce, Ariz.
Hoffman, Charles Raymond	I.E.-Feb.'49	Lykens
Hoffman, Donald Bernard	M.E.-Feb.'49	Allentown
Hoffman, Donald Lee	Bus.-June'51	Long Beach, N.Y.
Hoffman, Richard Herman	Bus.-June'50	Woodstown, N.J.
Hoffman, William Alfred, Jr.	Bus.-June'51	Nutley, N.J.
Hoffmann, Richard Aloysius	M.E.-Feb.'50	Trenton, N.J.
Hoffner, John Richard	M.E.-June'51	Bethlehem
Hoffstetter, Curtis Francis	M.E.-June'50	Allentown
Hogan, Edmund Ross, Jr.	M.E.-June'50	Easton
Hogg, John Webb, Jr.	Bus.-June'49	Broomall
Hogle, Albert Frederick, Jr.	Arts-June'50	Tenafly, N.J.
Hohl, John Stewart	I.E.-Feb.'49	Allentown
Hohmann, Gerald Duddy	E.E.-June'51	Wilkes-Barre
Hohmann, Lawrence Anthony, Jr.	E.E.-June'51	Wilkes-Barre
Holben, Robert George	E.E.-June'50	Allentown
Holcombe, Edward Joseph	Bus.-June'49	Lambertville, N.J.

Hollingsworth, James Hall, Jr.	I.E.-June'49	Landenberg
Hollingsworth, John Herbert	Bus.-Feb.'49	Marshallton, Del.
Holman, George Brayton	Bus.-June'51	Hackensack, N.J.
Holman, Robert Miller	Arts-June'52	Hazleton
Holmberg, Centre William, Jr.	I.E.-Feb.'52	New Rochelle, N.Y.
Holmes, Joseph Austin	Arts-Feb.'51	Caracas, Venezuela
Holmes, Richard Lee	Arts-June'52	Philadelphia
Holt, Donald Rivers	Arts-June'52	Camden, N.J.
Holtvedt, James Armstrong	C.E.-June'51	Wilton, Conn.
Holyoke, James Peck	E.E.-June'49	Milwaukee, Wis.
Honeyman, Robert Newton	Met.E.-June'49	Glen Ridge, N.J.
Hontz, Norman Andrew	E.E.-June'51	Lehighton
Hood, James Gowen, Jr.	Chem.-June'50	Philadelphia
Hoops, Harold John	Arts-June'50	Tenafly, N.J.
Hoover, Herbert Christopher	I.E.-June'51	Havertown
Hoover, Herbert Leslie	E.P.-June'51	Montoursville
Horn, James Paul	Bus.-June'52	Johnstown
Horneck, George B.	Arts-June'49	Baldwin, N.Y.
Horner, Roger	M.E.-June'50	Westfield, N.J.
Horner, Thomas Russell	E.E.-Feb.'50	Bethlehem
Horning, David Arthur	C.E.-June'50	Lancaster
Horning, Robert Henry	I.E.-June'52	Elizabeth, N.J.
Horton, Edward Kenneth	Arts-June'52	Rockville Centre, N.Y.
Horvath, Michael Joseph	Arts-June'51	Northampton
Hosfeld, Lewis Kohler	Chem.-June'50	Macungie
Hosfeld, Richard Kohler	E.E.-June'50	Macungie
Hosford, William Fuller, Jr.	Met.E.-June'50	Butler, N.J.
Hostetter, Albert Emmanuel	C.E.-June'49	East Stroudsburg
Hostetter, John Beale	Ch.E.-June'51	Matawan, N.J.
Houghton, Frederick Percival, Jr.	Arts-June'51	Warrington
Houser, Wesley Grant	E.E.-June'49	Lebanon
Housley, John Gamaliel	E.E.-June'51	Elkins Park
Houston, David Richard	E.E.-June'49	Allentown
Houston, Jack Spalding	Arts-Feb.'50	Allentown
Howard, Raymond Theodore	Bus.-June'49	Ossining, N.Y.
Howell, Charles Zellner	Ch.E.-June'51	Allentown
Howells, Lewis William, Jr.	E.M.-June'51	Orefield
Hower, Meade Martin	E.P.-June'49	Allentown
Howie, Eugene Gabriel	Bus.-June'52	Brooklyn, N.Y.
Howland, William Garth	Arts-June'51	Bethlehem
Howse, Philip Chase	Bus.-June'50	Exton
Hoxie, Earle Charles	Met.E.-June'52	Hatboro
Hoyt, Alden Grenell, Jr.	I.E.-June'50	Baltimore, Md.
Hoyt, Leon Glover, Jr.	I.E.-June'50	Summit, N.J.
Hoyt, Robert Townsend, Jr.	Arts-June'51	Plainfield, N.J.
Hoza, Martin David	M.E.-Feb.'52	Cortland, Ohio
Huber, Robert Crouse	Arts-Feb.'50	Hillside, N.J.
Huber, William Charles	Bus.-June'49	Egypt
Hubler, Eugene Wesley	C.E.-June'49	Reading
Hubsch, Donald Milton	Bus.-June'52	Freeport, N.Y.
Hucks, Robert Tyler	Ch.E.-June'50	Milltown, N.J.
Hudock, Albert Michael	M.E.-June'52	Coatesville
Huether, Harry Calvin	M.E.-June'52	Baltimore, Md.
Hughes, Douglas Alan	Arts-June'52	Hamilton Square, N.J.
Hughes, Edward Royal	E.E.-June'50	Allentown

Hughes, Joseph Anthony	M.E.-June'51	Dallas
Hughes, Norman Hartley	Arts-June'49	Jersey City, N.J.
Hughes, Robert Edward	Chem.-June'49	Jackson Heights, N.Y.
Hummel, Stanley Charles	I.E.-June'49	Nazareth
Humphrey, John Milton III	Bus.-June'50	Dallas
Humphreys, William Griffith	M.E.-June'49	Aldan
Hundt, Robert William	Bus.-June'49	Forest Hills, N.Y.
Hunt, Valerio Roderique	E.P.-June'49	Kingston
Hunt, William James	Arts-June'49	Jackson Heights, N.Y.
Hunter, Calvin Kerr	C.E.-June'49	Philadelphia
Hunter, Richard McKnight	Bus.-June'51	Manhasset, N.Y.
Hurd, William Allen	M.E.-June'50	Newburgh, N.Y.
Husovsky, George Richard	Bus.-June'49	Bethlehem
Husta, Richard Philip	M.E.-June'50	Great Neck, N.Y.
Hutchins, Rheiner Thomas II	Arts-Feb.'50	Bethlehem
Hyatt, Charles Scott	Ch.E.-June'52	Columbus, Ohio
Hyatt, Donald Loring	M.E.-June'49	Allentown
Hyatt, Harold Asa	E.M.-June'52	Kingston, N.Y.

Ibach, Philip Brown	M.E.-June'49	Esterly
Imbriana, Michael Robert	Bus.-June'52	Bound Brook, N.J.
Ingersoll, John Herberton	Bus.-June'50	Charlotte, N. C.
Iobst, Edgar Henry, Jr.	Chem.-June'50	Emmaus
Irwin, Richard Webb, Jr.	M.E.-June'51	Pittsburgh
Isaac, Anthony John	C.E.-Feb.'50	Bethlehem
Isles, Daniel Entwisle	Arts-June'51	Passaic, N.J.

Jackson, Daniel Wyer	E.E.-June'50	Darlington, Md.
Jackson, Eugene Alexis	Arts-June'51	Norwalk, Conn.
Jackson, James McCarson	E.P.-June'49	Pittsburgh
Jackson, James Walter	Arts-June'51	Englewood, N.J.
Jackson, William Clark	Arts-June'51	Warsaw, N.Y.
Jacobs, Robert	Arts-June'51	Lansford
Jacobs, Robert Joseph	C.E.-June'51	Akron, Ohio
Jacobson, Donald Robert	E.E.-June'49	Lynbrook, N.Y.
Jacobsen, Jerome Gill, Jr.	E.P.-June'49	Towson, Md.
Jacoby, Charles Edward	M.E.-June'50	Bethlehem
James, Thomas Edward	M.E.-June'49	Edwardsville
Jani, Paul John, Jr.	Bus.-Feb.'49	Bethlehem
Janssen, Henry Theodore	I.E.-Feb.'50	Allentown
Jarden, Carroll Rockefeller, Jr.	Bus.-Feb.'51	Jenkintown
Jareckie, Stephen Barlow	Arts-June'51	Madison, N.J.
Jaynes, Edward Butler	Chem.-Feb.'51	Erie
Jefferis, Gilpin, Hazard, Jr.	M.E.-June'49	Passaic, N.J.
Jelly, Irving Augustus, Jr.	M.E.-Feb.'49	Palmerton
Jenks, Daniel Ashley, Jr.	Arts-June'52	Holyoke, Mass.
Jenness, Eric McPherson	Bus.-June'51	Baltimore, Md.
Jennings, Albert Edward, Jr.	Arts-June'50	Bethlehem
Jennings, Arthur Snyder	C.E.-June'50	Morton
Jennings, Frank Louis	Arts-Feb.'51	Wynnewood
Jensen, Albert John	Arts-June'52	New York, N.Y.
Jensen, Charles Lawrence	E.E.-June'49	Brooklyn, N.Y.
Jensen, William Robert	G.C.D.	New York, N.Y.
Jimenez, Ricardo Arturo	E.M.-June'49	Wanaque, N.J.
Job, Kenneth George Bordigon	C.E.-Feb.'49	Little Ferry, N.J.

Johns, Walter Scott III	E.E.-June'49	Philadelphia
Johnson, Alan William	M.E.-Feb.'50	Maplewood, N.J.
Johnson, Clinton Heath, Jr.	I.E.-Feb.'49	Baltimore, Md.
Johnson, George William	Ch.E.-Feb.'49	Chester
Johnson, John Arthur, Jr.	I.E.-Feb.'50	Jamestown, N.Y.
Johnson, Richard Edward	Ch.E.-June'49	Philadelphia
Johnson, Wesley Alan	M.E.-June'51	Bethesda, Md.
Johnson, William Kenneth	E.E.-June'50	Bradford
Johnston, James, Jr.	Met.E.-June'52	Philadelphia
Johnston, James Joseph	Arts-June'50	Larchmont, N.Y.
Jollie, William Pucette	Arts-June'50	Haddonfield, N.J.
Jones, Charles Andrews III	E.E.-June'50	West Englewood, N.J.
Jones, Garvin Lyon	E.E.-Feb.'50	West Englewood, N.J.
Jones, John Hugh	M.E.-June'49	Bethlehem
Jones, Owen John, Jr.	Ch.E.-Feb.'50	Hellertown
Jones, William Colenso, Jr.	Bus.-June'51	Carbondale
Jones, Wilmot Carlyle, Jr.	M.E.-Feb.'51	Jeddo
Jordan, Gerald Alan	Arts-June'52	Rye, N.Y.
Jordan, John Walter	Arts-June'50	Bloomfield, N.J.
Josenhans, Frederick George, Jr.	M.E.-June'51	Brooklyn, N.Y.
Joyce, John Elwood	Arts-June'49	Bridgeton, N.J.
Jubell, David Harry	I.E.-June'50	Shaker Heights, Ohio
Judd, Henry Clarence	Bus.-Feb.'49	Philadelphia
Judge, William Quentin	Met.E.-June'52	Chatham, N.J.
Judson, Allan Brasier	Arts-June'50	Montclair, N.J.
Jurgenson, Quentin Charles	I.E.-June'49	Rockville Centre, N.Y.

Kachel, Guy Robert	C.E.-June'49	Haddonfield, N.J.
Kachline, Harold Stump	M.E.-June'49	Quakertown
Kadingo, Nicholas Gabriel	E.E.-June'52	Shamokin
Kaercher, Charles Albert, Jr.	I.E.-Feb.'51	Bethlehem
Kahrs, Gordon John	Ch.E.-Feb.'51	East Hampton, N.Y.
Kaiser, George Charles	Arts-Feb.'50	Cranford, N.J.
Kalmbach, Frederick Charles	M.E.-June'50	Bethlehem
Kaminsky, Edmund Leonard	C.E.-June'49	Freeland
Kamp, Robert Fred	I.E.-Feb.'51	Shamokin
Kane, James Thomas	Bus.-June'50	Brooklyn, N.Y.
Kanehann, Joseph Anthony	Chem.-June'50	Allentown
Kanenson, William Lee	Arts-June'51	Bethlehem
Kaplan, Daniel Richard	Arts-June'52	Newark, N.J.
Kaszyski, Michael Stanley	Bus.-June'52	Northampton
Kaszyski, William Michael	Bus.-Feb.'51	Northampton
Kauffman, Harold Lincoln	I.E.-June'52	New Tripoli
Kaufman, Jerome Williard	Met.E.-June'49	Philadelphia
Kaulius, Robert Alphonses	M.E.-June'51	Easton
Kaup, Edgar George	Chem.-June'49	Glen Ridge, N.J.
Kearney, Dickinson Roberts	Ch.E.-June'51	Fanwood, N.J.
Keefe, Robert Mark	I.E.-June'51	Mount Vernon, N.Y.
Keefe, William Thaddeus, Jr.	E.E.-June'52	Trenton, N.J.
Keegan, James Francis	Bus.-Feb.'51	Byram, Conn.
Keel, Thomas Herbert	M.E.-June'51	Forest Hills, N.Y.
Keeler, Donald Lowe	M.E.-June'50	Roslyn
Keene, Bruce Richard	M.E.-June'49	Margate, N.J.
Kehoe, George Hulls	I.E.-Feb.'49	Niagara Falls, N.Y.
Kehrli, Henry Stewart	M.E.-June'50	Dunmore

Keller, Charles Stauffer	M.E.-June'49	Reading
Keller, Donald Lee	Arts-June'52	Reading
Keller, James Joseph	Arts-June'52	Philadelphia
Kelley, David Philip	E.E.-June'49	Washington, D. C.
Kelley, Joseph Benedict	Bus.-June'50	South Orange, N.J.
Kelley, Paul Kenneth	Arts-June'51	West Orange, N.J.
Kello, Stephen	E.E.-June'51	Bethlehem
Kellogg, John Mahon	Arts-Feb.'52	Ambler
Kellogg, Lawrence Putnem, Jr.	Bus.-June'51	White Plains, N.Y.
Kelly, Harlan Miner	Ch.E.-June'52	Gloucester, N.J.
Kelly, Jack Evans	E.P.-Feb.'52	Yonkers, N.Y.
Kelly, Robert Paul	Bus.-June'51	Wappingers Falls, N.Y.
Kelsey, John Morrison	Bus.-Feb.'51	Bogota, N.J.
Kelsey, Richard Walter	Arts-June'50	Sparta, N.J.
Kelsey, William Harrison	Arts-Feb.'51	Bogota, N.J.
Kendig, Robert Nissley	M.E.-June'49	Salunga
Kennedy, James Neilson, Jr.	Bus.-June'51	Youngstown, Ohio
Kenworthy, John Bruce, Jr.	Met.E.-Feb.'51	Upper Darby
Kephart, Doyle Marvin	Bus.-Feb.'49	Bethlehem
Keppel, Russell Newell	Bus.-June'49	Cranford, N.J.
Keppel, Wallace Waring	Bus.-June'51	Cranford, N.J.
Kerchner, Leonard Arthur	Ch.E.-Feb.'50	Bethlehem
Kercimar, Francis Charles	Arts-June'50	Allentown
Kerr, John Herbert	Arts-June'52	Wyncote
Kerrick, Edgar Alfred	Ch.E.-Feb.'50	Stoddartsville
Kershner, Charles Lyon	M.E.-June'50	Reading
Kester, Alton Arthur	C.E.-Feb.'49	Emerald
Kester, William Kenneth	Ch.E.-June'52	New Brighton
Kieshauer, Frederick Walter	E.E.-June'52	Warren
Kiesling, Charles Robert	Bus.-June'52	Abington
Kilroy, William Joseph, Jr.	E.E.-June'49	Allentown
Kimerer, John Vastine, Jr.	Bus.-June'52	Pittsburgh
Kimminour, Rodney Frederick	I.E.-June'50	Bethlehem
Kincaid, Raymond Charles	E.M.-Feb.'52	Allentown
Kindle, Herbert Darby, Jr.	Ch.E.-June'52	Pittsburgh
King, Edwin Gerald	E.E.-June'52	Chatham, N.J.
King, Russell Gold, Jr.	C.E.-June'51	Allentown
Kinsey, George Herbert, Jr.	E.P.-June'52	Brooklyn, N.Y.
Kircher, George Joseph	I.E.-Feb.'49	Long Island City, N.Y.
Kircher, Kenneth Joseph	Bus.-June'52	Union City, N.J.
Kirk, John Andrew	Bus.-June'50	Kearny, N.J.
Kirkpatrick, Joseph Graham	Bus.-Feb.'49	Pittsburgh
Kishpaugh, Allan Wilber	E.P.-June'49	West Orange, N.J.
Kissling, James Lenton	I.E.-Feb.'49	Wernersville
Kite, Wilson Jewell III	Met.E.-June'52	Westfield, N.J.
Kitson, Frederick Keyes	M.E.-Feb.'53	Glenside
Kitson, Harold, Jr.	E.E.-June'50	Glenside
Kizlinski, Leopold Aloysius	Arts-June'51	South River, N.J.
Kladivko, David	I.E.-June'50	Bound Brook, N.J.
Kleckner, Carl Edward	Bus.-June'49	Scranton
Klein, David Aylwin	Ch.E.-Feb.'50	Easton
Kleinwaks, Eugene	I.E.-Feb.'49	Newark, N.J.
Klemens, Edward Anthony	Chem.-June'50	Lansford
Kline, Charles Merrill	M.E.-June'50	Joanna
Kline, George Curtis III	Met.E.-June'52	Williamsport

Kline, Harold Emmett	Met.E.-Feb.'50	Harrisburg
Kline, John Milton, Jr.	Arts-June'49	Allentown
Kles, James Henry	Bus.-Feb.'50	Jenkintown
Klucher, Robert Hugh	C.E.-June'50	Hershey
Kluge, Frederick Frank	E.E.-June'50	West Orange, N.J.
Knauf, William George	M.E.-June'51	Philadelphia
Knecht, Norton Mark	Arts-Feb.'52	Allentown
Knee, Edward Howard Joseph, Jr.	Ch.E.-June'51	Ebensburg
Knight, Calvert Gentry	C.E.-June'49	Philadelphia
Knipe, Wilbert Roy	Arts-June'50	Bethlehem
Knoderer, David Claude	Chem.-June'51	Verona, N.J.
Knouse, Albert Bauer	C.E.-June'51	Glenside
Knox, Herbert Benjamin III	Arts-June'50	Old Greenwich, Conn.
Kober, Stavely Bernett	M.E.-June'50	Beechhurst, N.Y.
Koch, Gerald Robert	M.E.-Feb.'52	Catasauqua
Koehn, Charles Hanson	E.M.-Feb.'52	Valley Stream, N.Y.
Kolakowski, Charles Francis, Jr.	M.E.-June'52	South River, N.J.
Kolm, Richard Herman	Bus.-June'51	Rockville Centre, N.Y.
Koppes, Alan Wayne	Arts-June'52	Basking Ridge, N.J.
Korb, Donald Carl	M.E.-June'52	Pittsburgh
Korkegi, Robert Hani	M.E.-June'49	Jackson Heights, N.Y.
Kostelnik, George Joseph	E.M.-Feb.'52	Bethlehem
Kotanchik, John Joseph, Jr.	Bus.-Feb.'50	Shamokin
Kovacs, Julius Stephen	E.P.-June'50	Trenton, N.J.
Kovaka, George Alexander, Jr.	I.E.-Feb.'49	Bethlehem
Kovar, Sidney Joel	I.E.-Feb.'49	Clifton, N.J.
Kowalaski, Joseph David	M.E.-June'49	Bethlehem
Kozero, Paul Joseph	Arts-June'51	Northampton
Kraatz, Harold	E.E.-June'49	Forest Hills, N.Y.
Kradoska, Robert Allen	M.E.-June'52	Melrose Park
Kraemer, Ralph Louis	C.E.-June'51	Scranton
Kramer, Henry L. C.	Arts-June'52	Rockville Centre, N.Y.
Kramer, Joseph Ernest	M.E.-Feb.'49	Perkasie
Krauss, Richard Coons	Bus.-Feb.'50	Elkins Park
Krehbiel, Harry Ernst	Arts-June'52	Scarsdale, N.Y.
Krenicky, John George	E.P.-June'51	Bethlehem
Krenitsky, Paul	E.E.-June'52	Olyphant
Kresge, Grant Charles	M.E.-June'49	Northfield, N.J.
Kress, Howard Alfred	M.E.-Feb.'49	Allentown
Kress, Scott Walker	E.E.-Feb.'50	Pitman, N.J.
Krick, Edward VanOrder	I.E.-June'50	Bethlehem
Krieg, Louis Ernest, Jr.	I.E.-June'50	Allentown
Kroll, Edward Emil	Bus.-June'50	Bethlehem
Kropp, Paul Milton, Jr.	E.E.-June'50	Allentown
Kruger, Henry Austin	E.E.-June'50	Wilkes-Barre
Kuentz, Oscar Craig	M.E.-June'50	Plainfield, N.J.
Kuhar, Joseph George	Bus.-Feb.'50	Bethlehem
Kuhlke, William Charles	E.P.-June'52	Westfield, N.J.
Kuhns, Robert Melvin	M.E.-Feb.'50	Allentown
Kuipers, William Edward, Jr.	Bus.-June'52	Fair Lawn, N.J.
Kulp, Richard Brick	Bus.-June'52	North Wales
Kunkel, Paul Francis	M.E.-Feb.'50	Kutztown
Kunsman, Eugene Erwin	I.E.-Feb.'49	Bethlehem
Kuntz, Clifford Philip	C.E.-June'52	St. Albans, N.Y.
Kuntzelman, Harry Charles	E.E.-June'49	Pottstown

Kurtz, Gerald William	Chem.-June'52	Nazareth
Kurtz, Jack Risser	C.E.-June'52	Ephrata
Kuss, August Charles III	Bus.-June'52	Allentown
Kvochak, John Louis	Ch.E.-Feb.'50	Bethlehem
Laird, Allan, Jr.	E.E.-June'49	Stroudsburg
Laird, Samuel Wilson	Arts-Feb.'49	Rumson, N.J.
Lake, Frank Nelson	Ch.E.-June'49	Willoughby, Ohio
Lamana, Peter Anthony George	Arts-June'52	Bethlehem
Lambert, George James	E.E.-June'50	Staten Island, N.Y.
Lamson, John Parker	I.E.-Feb.'50	Hopewell, N.J.
Land, Alfred Joseph	E.E.-June'49	Brooklyn, N.Y.
Land, James Neville, Jr.	Bus.-June'52	Bedford
Landriau, Kenneth Driscoll	C.E.-June'49	Flushing, N.Y.
Landvater, John Howard	M.E.-June'49	Mount Joy
Lang, Donald Headdon	Bus.-Feb.'49	Sayville, N.Y.
Lange, Louis, Jr.	C.E.-Feb.'51	Bethlehem
Langenberg, Frederick Charles	Met.E.-June'50	Riverton, N.J.
Lanyon, Robert Peters	Ch.E.-Feb.'51	East Orange, N.J.
Lapides, Morton Mark	I.E.-June'51	Baltimore, Md.
Lapinsky, Anthony Leonard	Bus.-Feb.'49	Minersville
Larkin, Frank Joseph, Jr.	Bus.-June'51	Philadelphia
Larky, Arthur Irving	E.P.-June'52	Somerville, N.J.
Larky, Norbert David	E.P.-Feb.'49	Somerville, N.J.
Larson, William Theodore	I.E.-Feb.'50	Oil City
LaSasso, George Anthony	Arts-Feb.'50	Bethlehem
Lasser, Howard Gilbert	Ch.E.-Feb.'50	Larchmont, N.Y.
Laubach, Ward Eldon	E.E.-June'49	Easton
Laudenslager, Richard Frederick	C.E.-June'49	Bethlehem
Laughlin, William Stuart, Jr.	M.E.-June'51	Latrobe
Laury, John Theodore	Arts-June'50	Bethlehem
Lavine, Harris	Arts-June'49	Trenton, N.J.
Lavine, Richard Ellis	Bus.-June'49	Trenton, N.J.
Lawler, Stanley Palmer	M.E.-Feb.'50	Maplewood, N.J.
Lawrence, James Bruce	Arts-June'49	Bethlehem
Leach, George Harold	E.E.-June'49	Englewood, N.J.
Leaton, Edward King	M.E.-June'49	Mount Vernon, N.Y.
Lebo, Robert Lewis	M.E.-June'52	Bethlehem
LeComte, Douglas Kay	C.E.-June'52	Hollis, N.Y.
Lee, Charles Edward, Jr.	Ch.E.-June'50	Shoemakersville
Lee, Peynton Brotherhood, Jr.	M.E.-June'52	Dallas
Lee, Robert Garrison	Bus.-Feb.'51	Maplewood, N.J.
Lee, Robert Morton	M.E.-Feb.'51	Woodmere, N.Y.
LeFever, Stanton Brenneman	M.E.-Feb.'50	Bethlehem
Lehr, Harold Diefenderfer, Jr.	Bus.-June'49	Elkins Park
Leidheiser, Edward Steinel	Ch.E.-June'52	Maywood, N.J.
Leith, John Douglas, Jr.	Arts-June'52	Bethlehem
Leming, John Walter, Jr.	I.E.-Feb.'49	Midland
Lemmon, James Russell, Jr.	Bus.-June'51	Wynnewood
Lenhardt, Oliver Franklin	Arts-June'50	Norristown
Lenhart, James Herbert	E.E.-June'49	Bethlehem
Lenney, Ronald J.	Bus.-June'49	New York, N.Y.
Lentz, Charles Jerome	Bus.-Feb.'50	Palmerton
Lentz, Paul Albert	I.E.-June'50	Northampton
Lenz, Robert William	Ch.E.-June'49	St. Albans, N.Y.

Leonard, Francis William, Jr.	Bus.-June'50	Hillington, N.J.
Leopold, Jack Kern	M.E.-June'51	Nazareth
Lepper, Francis David	I.E.-June'52	Meadow Brook
Lerch, Archie Lauren	Bus.-Feb.'49	Rochester, N.Y.
LeRoy, Milton Joseph, Jr.	M.E.-Feb.'51	Ashtabula, Ohio
Leunis, William George	Bus.-Feb.'50	Bethlehem
Leuteritz, Raoul Hugh	Arts-June'52	Rockville Centre, N.Y.
Leuvelink, Ronald Bernard	Arts-Feb.'52	Mount Arlington, N.J.
Levan, Allen Edwin	Arts-June'52	Catawissa
Levan, Richard Harold	M.E.-June'51	Fleetwood
Leverich, Donald James	Bus.-June'50	Rye, N.Y.
Levine, Edward Bernard	Arts-June'50	Allentown
Levine, Richard George	Arts-Feb.'50	Lawrence, N.Y.
Levy, Irwin Alvin	Bus.-Feb.'51	Brooklyn, N.Y.
Lewanda, Morton	C.E.-Feb.'49	Brooklyn, N.Y.
Lewis, Donald Edson	M.E.-June'49	Clarks Summit
Lewis, Paton	Arts-June'50	Scarsdale, N.Y.
Lewison, Robert Martin	M.E.-June'50	New York, N.Y.
Li, Chen-Chia	Met.E.-June'49	New York, N.Y.
Lichtman, Robert William	Arts-June'49	South Orange, N.J.
Lichty, Donald Sherwood	M.E.-June'49	Allentown
Liddie, Donald Ferguson	I.E.-June'52	Maplewood, N.J.
Limons, Robert Anthony	Arts-June'50	Bethlehem
Lindgrove, Roger Martin	C.E.-June'50	Morristown, N.J.
Lindholm, Arne Carlson	Bus.-June'49	West Englewood, N.J.
Link, Ogden Wayne	Arts-June'52	Garden City, N.Y.
Lins, Richard Warg	Bus.-June'49	Bethlehem
Lisicky, Anton Joseph	E.E.-June'50	Allentown
Liss, Theodore Arthur	Chem.-June'52	Temple
Little, Gordon Douglas, Jr.	Bus.-June'51	Little Falls, N.Y.
Little, Leslie Ralph, Jr.	Ch.E.-Feb.'49	New Brighton
Loch, Joseph Frank	M.E.-June'52	Wilkes-Barre
Loehmann, Fred George	I.E.-Feb.'49	Waterbury, Conn.
Loewenwarter, Paul Louis	Bus.-June'50	Brooklyn, N.Y.
Lohman, Thomas Henry	Bus.-Feb.'49	Steelton
Lohrmann, Robert John	Bus.-June'49	West Orange, N.J.
Loizeaux, Timothy Roberts, Jr.	I.E.-June'50	Plainfield, N.J.
Lombardo, James Joseph	Met.E.-June'51	Drexel Hill
Long, Charles Wetzell	M.E.-June'49	Philadelphia
Long, Elmer John	M.E.-June'49	Watsontown
Long, George Donald	E.P.-June'51	Union, N.J.
Long, James Alexander, Jr.	Ch.E.-Feb.'49	Freemansburg
Long, James Thomas	C.E.-Feb.'50	Ridley Park
Long, Robert Charles	Ch.E.-June'49	West Lawn
Long, William James	Bus.-Feb.'49	Bethlehem
Longenberger, Fred Hartman	E.E.-June'51	Bethlehem
Longenhagen, John Bernard	Arts-June'51	Catasauqua
Longland, George Madara, Jr.	Ch.E.-June'49	Harrisburg
Longyear, Christopher Rudston	E.P.-June'52	Falmouth, Mass.
Lorch, Robert Warren	Arts-June'52	Plainfield, N.J.
Lore, Franklin Jerrell	C.E.-June'51	Bridgeton, N.J.
Lorentz, Herbert Tross, Jr.	Bus.-June'51	Pittsburgh
Loughran, John Richard	I.E.-June'49	Pottstown
Loux, Henry Arthur	Bus.-Feb.'52	Chatham, N.J.
Love, Donald Norton	Bus.-Feb.'49	Bethlehem

Lovell, James Henry, Jr.	Ch.E.-June'52	Springfield, N.J.
Lowry, Robert Kramer	Arts-June'50	Shaker Heights, Ohio
Luch, Myron Jacob, Jr.	I.E.-June'49	Allentown
Ludlow, Raymond Woodruff, Jr.	Ch.E.-June'51	Essex Fells, N.J.
Luedecke, Henry Marshall	I.E.-June'49	West Chester
Lukach, Carl Andrew	Ch.E.-June'52	Wilkes-Barre
Lummis, John Milton	Arts-Feb.'50	Roselle, N.J.
Luster, Richard Overton	C.E.-June'52	Hillside, N.J.
Luthy, Edward Charles	M.E.-June'50	Drexel Hill
Lyman, David Cass	M.E.-June'51	Montclair, N.J.
Lumpany, Byron Barney	Chem.-June'49	Wilkes-Barre
Lynch, Henry Merrill, Jr.	I.E.-June'49	Wilmington, Del.
Lynn, John Thomas, Jr.	Arts-June'49	Coplay
Lynn, Raoul Benjamin	E.E.-June'49	Bethlehem
Lyons, John Thomas	Bus.-June'51	Corning, N.Y.
Maack, Herbert Raymond	Bus.-June'49	Pottstown
Maas, Louis Olaf	E.E.-Feb.'52	Baltimore, Md.
MacArt, Robert Norman	Chem.-June'49	Pittston
Macatician, John	Arts-Feb.'51	Coaldale
Macaulay, Richard Allan	Bus.-June'51	Tenafly, N.J.
Macauley, Charles Robert	Arts-Feb.'50	Larchmont, N.Y.
MacDonald, Hugh Douglas, Jr.	Arts-June'51	Newark, N.J.
MacDonald, John Joseph	Bus.-June'51	Scranton
MacDougall, Donald Browning	Bus.-Feb.'51	South Orange, N.J.
MacFadden, John Alan	M.E.-Feb.'51	Pompton Plains, N.J.
MacGrath, Edward Wardlaw	M.E.-June'52	South Orange, N.J.
MacGregor, Louis Morgan	Arts-June'51	Allentown
Mack, Edgar Osborne	Bus.-June'51	Trenton, N.J.
MacKenzie, Malcolm	Bus.-June'52	South Orange, N.J.
MacKinnon, Walter Allan	Bus.-June'51	Mountain Lakes, N.J.
MacLaughlin, John Robert	Bus.-June'49	Bethlehem
MacLean, John Richard	I.E.-June'51	Rockville Centre, N.Y.
Maco, Paul Stephen	Bus.-June'50	Bethlehem
Macri, Samuel Joseph, Jr.	Arts-June'50	Fall River, Mass.
Madenford, Edward Karl	Bus.-June'49	Pottsville
Madfis, Theodore	Arts-June'50	Chestnut Hill, Mass.
Magagna, John Peter	Arts-June'50	Allentown
Mahan, James Augustus	M.E.-June'52	Toledo, Ohio
Maher, William Timothy	Bus.-June'52	North Tarrytown, N.Y.
Mahley, Robert Bryant	E.E.-June'52	Baldwin, N.Y.
Mahoney, John Francis, Jr.	M.E.-June'51	Merrick, N.Y.
Maier, Arthur Richard	Arts-Feb.'49	Rahway, N.J.
Main, Earl Leroy	Ch.E.-June'50	Baltimore, Md.
Maines, Leland Edward, Jr.	Bus.-June'50	Rutherford, N.J.
Malanaphy, Richard Hugh	C.E.-June'51	Wilmar, Calif.
Malcolm, Duncan Campbell	Arts-June'52	Staten Island, N.Y.
Maleson, Paul	M.E.-June'49	Philadelphia
Malizia, Bernard Frank	Ch.E.-June'51	Nutley, N.J.
Malone, Lawrence Richard	Arts-Feb.'49	Bergenfield, N.J.
Malone, Maurice Orrie	Met.E.-June'52	Chambersburg
Manbeck, Harry Frederick, Jr.	E.E.-June'49	Honesdale
Mancill, Robert Fairland	Bus.-June'49	Kennett Square
Mandel, George William	E.M.-June'50	Catasauqua
Mankin, Harry Augustus, Jr.	M.E.-June'51	Philadelphia

Manley, Francis McVeigh	Ch.E.-June'51	Elkins Park
Mann, William Henry	Ch.E.-Feb.'52	Upper Darby
Mantell, Robert Taitt	E.E.-June'52	Drexel Hill
Maragakes, Christopher	I.E.-Feb.'49	Astoria, N.Y.
Marcinek, Jack Joseph	M.E.-June'49	Shamokin
Marcks, Charles Oliver	Bus.-Feb.'49	Bethlehem
Marcus, Alan Jay	Bus.-June'52	Easton
Marcus, George	E.E.-June'49	New York, N.Y.
Marcussen, Victor Bremer, Jr.	Bus.-June'52	Englewood, N.J.
Margerison, Albert Earl, Jr.	E.E.-June'50	Elkins Park
Margiotti, Vincent John	Arts-Feb.'50	Newburgh, N.Y.
Mariette, Lyon Garvin	Bus.-June'52	Arlington, N.J.
Marks, William Culp	Ch.E.-Feb.'52	Westmont, N.J.
Marks, William Joseph	Bus.-June'52	Rockville Centre, N.Y.
Marsden, Edward Charles	Arts-June'51	West Hartford, Conn.
Mart, Thomas Leon	Arts-June'51	Kansas City, Mo.
Martenson, Herbert Eric	I.E.-June'51	Brooklyn, N.Y.
Martin, Andrew Ross	Bus.-Feb.'49	Spring Lake, N.J.
Martin, Eric Charles	Bus.-June'50	Staten Island, N.Y.
Martin, Harry Beresford	Arts-June'50	Norristown
Martin, John Andrew	Bus.-June'50	Pittsburgh
Martin, John Herbert	I.E.-June'51	Yonkers, N.Y.
Martin, John Joseph	Bus.-June'50	Brooklyn, N.Y.
Martin, Laurence Arnold	Chem.-Feb.'50	Union, N.J.
Martin, Robert John	I.E.-June'49	Chicago, Ill.
Martin, Thomas Joseph	E.E.-June'49	Queens Village, N.Y.
Martin, William Christopher	Ch.E.-Feb.'50	Bethlehem
Mason, William Edward	Arts-June'50	Kenmore, N.Y.
Masteller, Charles, Jr.	C.E.-Feb.'50	Bethlehem
Master, Hazen Parks	Arts-June'50	Rockville Centre, N.Y.
Masters, Wright Alexander	I.E.-Feb.'50	Philadelphia
Matamoros, Edgar	C.E.-June'52	San Jose, Costa Rica
Matthes, Andrew Savage Merrill	I.E.-June'50	Cleveland, Ohio
Matthes, William Lee, Jr.	E.E.-June'49	Manheim, W.Va.
Matthews, Ellery Moore	E.E.-Feb.'50	Du Bois
Mattison, Keith Wickham	M.E.-Feb.-49	Frewsburg, N.Y.
Matz, John William, Jr.	E.E.-June'50	Garden City, N.Y.
Maurer, Anthony Oliphint	C.E.-Feb.'51	Rockville Centre, N.Y.
Maurer, Joseph William III	Bus.-June'52	Philadelphia
Mavis, John Jordan	Arts-June'52	Bethlehem
Maxson, Frederick Gordon	E.E.-June'52	Clearwater, Fla.
Mayer, Sidney H., Jr.	Ch.E.-Feb.'52	Chicago, Ill.
Mayer, Warren Herbert	Bus.-Feb.'49	Rockville Centre, N.Y.
Mayzell, Bernard Leon	Bus.-June'52	Trenton, N.J.
McAlonan, Thomas John	I.E.-June'52	Glenside
McCann, Robert Munson	E.M.-June'52	Franklin, N.J.
McCarthy, Justin Kevin	Arts-Feb.'51	Bethlehem
McCarty, Kenneth Peter	Ch.E.-Feb.'49	Milford
McCauley, Wilbert Murdock, Jr.	E.E.-June'50	Greensburg
McClure, Samuel Richard	M.E.-June'52	Braddock
McCombs, Charles James	I.E.-June'49	Lancaster
McCoy, Daniel Emory	Bus.-June'52	Chester Springs
McCue, William Miles, Jr.	Met.E.-June'49	Fallsington
McCulloch, William Alexander III	I.E.-Feb.'52	Swarthmore

McDonald, Leonard	Bus.-June'51	South Charleston, W.Va
McGavin, Paul Peter	E.E.-June'52	Wilkes-Barre
McGeady, James Willard	Arts-Feb.'50	Freemansburg
McGee, Edward Hugh	Arts-June'52	Allentown
McGoldrick, Francis Michael, Jr.	Bus.-June'51	Nyack, N.Y.
McGrath, Thomas James	Bus.-June'50	Norwalk, Conn.
McGuckin, James Frederick	I.E.-June'52	Philadelphia
McGuire, Andrew Edward	I.E.-Feb.'50	Rumson, N.J.
McHose, Andre Howard	G.C.D.	Allentown
McHugh, Richard Nevin	Bus.-Feb.'49	Trenton, N.J.
McInerney, William Thompson	Bus.-June'49	Midland
McKay, Henry Lysholm	I.E.-June'52	Glenside
McKay, Hugh Dixon, Jr.	M.E.-June'52	Rye, N.Y.
McKinley, Hall Forbes	Bus.-June'52	East Orange, N.J.
McKnight, Andrew Norton	M.E.-June'50	Quakertown
McLaughlin, Francis Noel	Arts-June'52	Trenton, N.J.
McMorris, William Loring III	E.M.-June'52	Pittsburgh
McMullen, Randolph Bond	Arts-June'50	Rumson, N.J.
McNamara, James Edward III	Bus.-June'50	Yonkers, N.Y.
McNamara, Joseph Burk	Ch.E.-June'52	Williamsport
McQuade, Lynn Ware	I.E.-June'49	Haddonfield, N.J.
McRaven, Pilgrim Walker	I.E.-Feb.'49	Bethlehem
McWilliam, John Jeffrey	Bus.-June'49	Rockville Centre, N.Y.
Mead, George Alvin II	Ch.E.-June'52	Philadelphia
Meador, Harry Wallace, Jr.	Bus.-June'49	Big Stone Gap, Va.
Mease, Ernest William	M.E.-June'50	Washington, D. C.
Mease, James Wilson	E.P.-June'52	Temple
Meck, Harold R., Jr.	M.E.-June'50	Shillington
Medway, David Dale	Chem.-June'52	Gouldsboro
Meier, Norman Raymond	E.E.-June'50	Drexel Hill
Meinel, George Scattergood	I.E.-June'52	Huntingdon Valley
Meinhofer, Francis Lewis	Chem.-June'49	Coopersburg
Mellen, Raymond Ralph	Arts-June'49	Millburn, N.J.
Mellinger, Jack Cree	Ch.E.-June'49	Harrisburg
Mendler, Robert Fairchild	I.E.-June'49	Bethlehem
Mengoli, Karl Louis	M.E.-June'52	Plymouth, Mass.
Mensing, Henry John	E.M.-June'52	Woodside, N.Y.
Mentzer, Robert Evans	M.E.-June'52	Lititz
Merksamer, Norman Joel	Bus.-June'52	Dover, N.J.
Merritt, Robert Fisher	M.E.-June'50	Kingston, N.Y.
Mertz, Edgar Theodore	E.P.-June'52	Reading
Mertz, John Mercer, Jr.	M.E.-June'51	Wilmington, Del.
Mertz, William Richard	M.E.-June'49	Pittsburgh
Mesick, David	I.E.-June'52	Hudson, N.Y.
Metcalf, Albert Traver, Jr.	E.E.-June'50	Bethlehem
Meuter, Frederick William, Jr.	Arts-June'51	Ridgefield, N.J.
Meyer, George Frederick, Jr.	E.M.-Feb.'50	Maplewood, N.J.
Meyer, Herbert Milton	I.E.-June'52	Ridgewood, N.J.
Meyer, Jack Henry	Bus.-June'51	Belleville, N.J.
Meyer, Jerry Allen	M.E.-June'52	Trenton, N.J.
Meyer, Robert Dean	E.E.-June'50	Trenton, N.J.
Meyerhoff, Harry Charles	I.E.-June'49	Baltimore, Md.
Meyers, Richard Irving	I.E.-Feb.'49	Manasquan, N.J.
Michel, John	Arts-June'50	Freeland

Michie, Andrew Young III	Bus.-Feb.'50	New Britain
Michie, William Henry	Ch.E.-June'49	New Britain
Mickolay, Robert Hall	Arts-June'52	Bethlehem
Mierzwinski, Edmund Marjan	E.E.-June'50	Waterbury, Conn.
Mihalek, Joseph Rudolph	I.E.-Feb.'50	Swoyerville
Miksitz, Frank J.	G.C.D.	Nazareth
Milanese, William Anthony, Jr.	I.E.-Feb.'49	Hollis, N.Y.
Miles, Theodore Joseph	E.P.-June'50	Catasauqua
Miller, Arthur Gene	E.E.-June'50	New Rochelle, N.Y.
Miller, Carl Benjamin	Ch.E.-Feb.'50	Coopersburg
Miller, Charles Parker	Arts-June'51	Birmingham, Ala.
Miller, Donald Floyd	M.E.-June'50	Laureldale
Miller, Edgar Hanmer	I.E.-June'49	Bethlehem
Miller, Emory Wells	E.M.-Feb.'52	Passaic, N.J.
Miller, Frank William, Jr.	Arts-June'52	Allentown
Miller, George Frederick	Arts-Feb.'51	Tamaqua
Miller, Grier Bovey	I.E.-June'49	Glassboro, N.J.
Miller, Harlan Stamford	Ch.E.-June'52	Bethlehem
Miller, Herron White	Chem.-June'51	Trenton, N.J.
Miller, John Clark	Ch.E.-June'52	Altoona
Miller, John Galt	I.E.-Feb.'52	Milwaukee, Wis.
Miller, John Henry	Bus.-June'51	Northampton
Miller, Joseph Ambrose	Arts-Feb.'49	Allentown
Miller, Karl Gritz	Bus.-Feb.'49	Allentown
Miller, Kenneth Edward	Bus.-Feb.'50	Allentown
Miller, Melvin David	Arts-June'49	Philadelphia
Miller, Richard Charles	M.E.-Feb.'51	Bethlehem
Miller, Richard Sheely	I.E.-Feb.'50	Camp Hill
Miller, Robert Lee	I.E.-June'49	New Kensington
Miller, Roger Dickson	E.P.-June'50	Cheltenham
Miller, Theodore Alexander	I.E.-June'51	Scranton
Miller, Thomas Edward	E.E.-June'52	Milwaukee, Wis.
Miller, William Martin	Bus.-June'50	Hummelstown
Miller, William Russell	M.E.-Feb.'49	Wyoming
Millet, Marcel Fernand	Bus.-Feb.'50	Wyomissing
Mills, Daniel Clay, Jr.	Arts-June'52	Bethlehem
Minde, Theodore Arthur	Arts-June'50	Summit, N.J.
Mindlin, Harold	M.E.-June'52	Bethlehem
Mink, Frank Allen, Jr.	C.E.-June'51	Kennett Square
Minnich, Joseph Pilkey	Ch.E.-June'52	Binghampton, N.Y.
Mirenna, Louis	Bus.-June'50	Phillipsburg, N.J.
Miron, Ray Richardson Hurlbut	Arts-Feb.'52	Allentown
Misenheimer, Martin David	Arts-Feb.'52	Hamilton, Ontario
Missimer, Lyman, Jr.	Bus.-June'52	Penn Valley
Missimer, Samuel Harold	Arts-June'50	Allentown
Mitchell, John Albert	E.E.-June'49	Allentown
Mitchell, John D.	I.E.-Feb.'49	Bridgeton, N.J.
Mitchell, Robert Edward	Arts-June'51	Englewood, N.J.
Mitchell, Ronald Corriston	Arts-Feb.'51	Bethlehem
Mitchell, Steve	E.M.-Feb.'52	Trenton, N.J.
Mitman, Stewart Phipard	Bus.-June'49	Huntington, N.Y.
Mittal, Edward George	I.E.-June'50	Bethlehem
Mobus, Charles Bromwell	E.E.-June'50	Plainfield, N.J.
Mock, Walter Willis, Jr.	I.E.-June'50	Rutherford, N.J.
Mohr, Frederick Schaefer	E.E.-June'51	Ardmore

Mohr, Richard Arnold	Ch.E.-June'52	Bethlehem
Mohr, Thomas Henry	Arts-June'52	Bethlehem
Mohrhardt, Frederick, Jr.	Bus.-June'50	Larchmont, N.Y.
Moler, Edwin Stanton	Arts-June'52	West Orange, N.J.
Moll, David Martin	Arts-Feb.'50	Fair Haven, N.J.
Mondor, Edward Joseph	E.E.-June'51	Pelham Manor, N.Y
Monek, Edward Walter	Bus.-June'52	Bethlehem
Monsell, Jesse Monroe, Jr.	Bus.-June'51	Greenport, N.Y.
Moodie, Donald Meikle	M.E.-June'52	Montclair, N.J.
Moodie, Stanley Thompson	Bus.-June'49	Grove City
Moodie, William Carmichael, Jr.	M.E.-Feb.'50	Montclair, N.J.
Moore, Eugene Willard, Jr.	Bus.-June'51	Pittsburgh
Moore, Robert Franklin, Jr.	E.E.-June'50	Maplewood, N.J.
Moore, Robert Raymond	Arts-June'51	Lock Haven
Moore, Stanley Raymond	E.E.-June'51	Glen Rock, N.J.
Moorehouse, John Walter, Jr.	Ch.E.-June'51	Philadelphia
Moran, Walter Lembke II	Bus.-June'52	Maplewood, N.J.
Morgan, John Clarence	E.E.-June'49	Kingston
Morgan, Ronald Brandt	Bus.-June'50	Morrisville
Morgart, Frank Hartley, Jr.	Bus.-June'50	York
Morley, William Murray	M.E.-June'51	Philadelphia
Morris, Andrew King John	I.E.-June'50	Clarks Summit
Morris, John Robertson	E.E.-June'51	Paterson, N.J.
Morrison, Charles Henry	E.E.-Feb.'52	Hagerstown, Md.
Morrison, Donald Bruce	Ch.E.-June'51	Rocky River, Ohio
Morrison, Richard Hemsing	Arts-Feb.'50	Coopersburg
Morrissey, Frederick James Edward	Bus.-June'50	Forest Hills, N.Y.
Morrow, David Randolph	C.E.-June'52	Teaneck, N.J.
Morton, George Henry	Ch.E.-June'50	Mamaroneck, N.Y.
Morton, Walter Benson, Jr.	E.E.-June'50	Bethlehem
Moscotti, Richard William	Arts-June'51	Atlantic City, N.J.
Moses, Willis Sumner	Bus.-Feb.'50	Edgewater Park, N.J.
Moskowitz, John	M.E.-June'50	Philadelphia
Mould, Richard A.	E.P.-June'51	Reading
Mounce, Lawrence Morrison	Arts-June'52	North Bergen, N.J.
Mountsier, John Stevenson	I.E.-Feb.'50	Nutley, N.J.
Moxley, Arthur Reed	Ch.E.-June'49	Scranton
Moxley, Charles Ward	Arts-June'51	Scranton
Moyant, George Carl	E.E.-June'51	Medford, N.J.
Moyer, Gilbert Alfred	Arts-June'50	Hellertown
Moyer, Grant Luke	Arts-Feb.'49	Bethlehem
Moyer, Joseph Bradley	E.E.-June'51	Morristown
Moyer, Norman Elmer	Bus.-June'51	West Lawn
Moyer, Philip Franklin	C.E.-Feb.'49	Doylestown
Moyer, Ronald Festus	Bus.-June'51	Reading
Moyer, Stanley William	Bus.-Feb.'51	Emmaus
Moyer, Vance Edwards	E.P.-June'50	Pottsville
Moyer, Walter Noel	Bus.-June'52	Bogota, N.J.
Mueller, Donald Elmer	Bus.-June'49	Houston, Tex.
Muffley, Robert Thomas	Bus.-Feb.'49	Bethlehem
Muhlfeld, John Peter	Bus.-June'52	Larchmont, N.Y.
Muller, Harvey Warren	Bus.-June'51	Valley Stream, N.Y.
Muller, Paul William	M.E.-June'51	Princeton, N.J.
Muller, Peter Yates	Arts-June'52	Scarsdale, N.Y.

Mulock, Lawrence Edward	E.E.-June'50	Bethlehem
Murphy, Daniel Francis	Arts-June'51	North Tarrytown, N.Y.
Murphy, Peter Gerald	Arts-June'51	Baldwin, N.Y.
Murphy, William Charles	Bus.-June'50	Lebanon, N. H.
Murphy, William Henry, Jr.	Bus.-June'50	Westfield, N.J.
Murray, Frank Joseph	M.E.-June'51	Montclair, N.J.
Murray, George Francis	C.E.-June'49	Englewood, N.J.
Murray, Michael John	E.E.-Feb.'50	Sayre
Murray, William Elmer III	M.E.-June'52	Pelham, N.Y.
Musser, Warren VanDyke	I.E.-June'49	Harrisburg
Myers, Clyde Francis	Bus.-Feb.'50	Hanover
Myers, Harry Edward	E.E.-June'49	Collingdale

Nally, John Martin	Bus.-June'49	Reading
Nancarrow, William Morgan	Ch.E.-Feb.'51	Plymouth
Napoliello, Ferdinand Joseph	Arts-June'52	West Caldwell, N.J.
Nash, Claude Walter	E.P.-Feb.'50	Jackson Heights, N.Y.
Navarro, Dominic, Jr.	Bus.-June'50	Pittsburgh
Neave, Albert Richard	Met.E.-June'52	Mount Vernon, N.Y.
Needles, Henry Clinton	Arts-June'50	Cape May, N.J.
Nelson, Morris Robert, Jr.	E.P.-June'52	Alexandria, Va.
Nelson, Thomas Perry	M.E.-Feb.'52	Denver, Colo.
Nepon, Gerald Denis	I.E.-June'50	Newark, N.J.
Nere, John Anthony	I.E.-June'49	Valley Stream, N.Y.
Nesbit, Peterson	Arts-June'52	Cleveland, Ohio
Neuweiler, Louis Philip, Jr.	Bus.-June'51	Allentown
Nevitt, John Gartrell	Met.E.-June'52	Tacoma Park, Md.
Nevius, Carter Hutchison	Arts-Feb.'52	Westfield, N.J.
Newburg, Arthur Stephen	I.E.-June'52	New York, N.Y.
Newhard, Fred Jerome, Jr.	Ch.E.-Feb.'50	Allentown
Newhart, James Erck	Chem.-June'49	Lehighton
Newlin, William Sims, Jr.	M.E.-June'52	Ardmore
Newman, Robert Alan	I.E.-June'50	Forest Hills, N.Y.
Newman, Rockwell Henry, Jr.	Bus.-June'51	South Orange, N.J.
Nice, Milo Alonzo, Jr.	Arts-June'52	Wilmington, Del.
Nicholls, Charles Wesley	E.M.-June'49	Pitman, N.J.
Nichols, Robert Perry	I.E.-Feb.'50	Bethlehem
Nichols, Robert Stanton	Arts-June'50	Clifton, N.J.
Nichols, William Ayres	Bus.-June'49	Westfield, N.J.
Nicholson, Charles Alfred	Bus.-Feb.'50	Williamsport
Nickel, Bruce Alfred	Ch.E.-June'52	Mount Vernon, N.Y.
Nickolaus, Donald Charles	I.E.-June'49	Bethlehem
Nimmo, Stuart Frayne	Bus.-June'49	Murray Hill, N.J.
Nino, Robert Victor	E.E.-June'49	Garden City, N.Y.
Noble, John Stanley	Bus.-Feb.'50	Southampton
Noel, James Arthur	Arts-June'49	Williamstown
Nolan, John Curry	Arts-June'50	Buffalo, N.Y.
Nolan, Joseph Peter	Chem.-June'52	Ridgewood, N.J.
Nolan, Robert Emmett, Jr.	E.M.-June'51	Scranton
Noll, Burton Ambrose, Jr.	M.E.-June'51	Palmerton
Noll, Forrest Jacob, Jr.	Arts-June'52	Nazareth
Noonan, Harry James	Ch.E.-June'52	Bridgeport, Conn.
Noone, Roger	Arts-June'51	Scranton
Norberg, Carl Beaumont	I.E.-Feb.'51	Philadelphia
Nordenholt, George Claus	M.E.-June'50	Chatham, N.J.

Norris, Charles Walter	E.P.-Feb.'52	Washington, D.C.
Norris, Richard Alfred	Chem.-June'49	Atlantic City, N.J.
Norton, Curtis Lacy, Jr.	Bus.-June'51	Philadelphia
Norton, Nathaniel Shaw, Jr.	Bus.-June'50	Buffalo, N.Y.
Norton, Richard Eyre	E.P.-Feb.'52	Greenwich, Conn.
Norton, Thomas Wakeman	Ch.E.-June'51	Morris Plains, N.J.
Nothstein, Louis Israel	M.E.-Feb.'51	Mauch Chunk
Numbers, Robert Warren	C.E.-June'50	Allentown
Nutting, James Barrett	Arts-June'49	Boston, Mass.
Nylin, John William	Arts-June'51	Rockville Centre, N.Y.
Nylin, Robert Eugene	Bus.-Feb.'49	Rockville Centre, N.Y.

Oberhardt, Rolland Bertram	Bus.-June'51	Pelham, N.Y.
Oberholzer, Walter Fred	Bus.-June'49	Allentown
O'Brien, Duncan Thomas	Bus.-June'49	New York, N.Y.
O'Brien, Gerald David	Arts-June'49	Lebanon, N.J.
O'Brien, James George	Bus.-June'50	Phillipsburg, N.J.
O'Donnell, John Richard	E.E.-June'52	Allentown
Oechsle, Robert William	Bus.-June'51	Philadelphia
Oehm, Frederick Arthur, Jr.	E.E.-June'52	Washington, D. C.
Offerdahl, John Einar	Ch.E.-June'51	Warren, Ohio
Offner, Charles	Arts-Feb.'51	Brooklyn, N.Y.
Ogilvie, Bruce Nelson	I.E.-June'49	Oceanside, N.Y.
Ogle, Edward Arthur, Jr.	Bus.-Feb.'51	Hewlett, N.Y.
Ojserkis, Richard	I.E.-Feb.'51	Atlantic City, N.J.
O'Keefe, Donald Cowan	M.E.-June'49	Margate City, N.J.
O'Keefe, Raymond Leo, Jr.	Bus.-June'50	Margate City, N.J.
Oldach, Hugh Graham	M.E.-June'50	Philadelphia
Oldroyd, Donald Middlebrook	Bus.-June'49	Ridgewood, N.J.
O'Leary, William John	C.E.-June'52	Elizabeth, N.J.
Olischar, William Harry	Arts-June'51	Pittsburgh
Oliver, James Dominic	M.E.-Feb.'51	Pittston
Olstad, Martin Day	E.P.-June'51	Port Washington, N.Y.
Olwine, John Clayton, Jr.	I.E.-June'50	Maplewood, N.J.
Omholt, Ray Edward	Arts-June'52	Overbrook Hills
O'Neill, Thomas Paul	Bus.-Feb.'52	Margate, N.J.
Onila, John	I.E.-June'51	Canton, Ohio
Orford, Richard Jason	E.E.-June'50	Allentown
Orlando, Anthony James	E.E.-Feb.'51	Brooklyn, N.Y.
Orlemann, Robert Duff	Bus.-June'51	Jenkintown
Orr, Joseph Hughes	C.E.-June'52	Altoona
Ort, Donald Leroy	E.E.-June'52	Cumberland, Md.
Osler, Wilbur Fisk	M.E.-June'52	Leonia, N.J.
Osman, Robert James, Jr.	Bus.-June'50	Allentown
Oswalt, James Martin	Arts-June'52	Juniata
Ott, Peter Hutton	Bus.-Feb.'52	Bradley Beach, N.J.
Ott, Robert Yellis	Arts-Feb.'50	Philadelphia
Otten, William John	Arts-Feb.'50	Carlstadt, N.J.
Otto, Theodore Charles, Jr.	M.E.-June'50	Red Bank, N.J.
Overmeyer, James	E.P.-June'49	Columbia

Page, Constantine	Arts-June'52	Grove City
Painter, George Grant, Jr.	Bus.-June'52	Muncy
Palasky, Ervin Carl	E.E.-Feb.'51	Trenton, N.J.
Palmer, Donald Lee	E.P.-June'52	Matamoras

Panasiuk, Fred, Jr.	E.E.-June'50	Hellertown
Pappas, Peter	M.E.-June'49	Tottenville, N.Y.
Pappas, Peter James	Bus.-June'49	Elizabeth, N.J.
Paragone, Albert Peter	Bus.-June'50	St. Albans, N.Y.
Pariseau, Joseph Henri, Jr.	M.E.-June'51	Bloomfield, N.J.
Park, Ivan Clinton	I.E.-June'52	Upper Montclair, N.J.
Parker, Donald Thomas	Bus.-June'51	Bronxville, N.Y.
Parker, Reginald Schlegel	Arts-June'49	Allentown
Parker, Richard Johnson	Bus.-June'52	Allentown
Parmentier, Jan Christian	E.E.-June'51	Allentown
Parry, Thomas Closs	Met.E.-June'52	Niagara Falls, N.Y.
Parseghian, Mark, Jr.	Ch.E.-Feb.'49	Nazareth
Parsons, Edward Dippolt, Jr.	M.E.-Feb.'52	Trenton, N.J.
Parsons, Richard Wade	Bus.-Feb.'49	Pleasantville, N.Y.
Partington, David Henry	Arts-June'51	Plainfield, N.J.
Pasquariello, John Ray	Arts-June'51	Allentown
Pasquariello, Julius Salvatore, Jr.	Arts-June'52	Allentown
Passantino, Sebastian Philip	C.E.-June'52	Englewood, N.J.
Patterson, Donald, Jr.	Arts-June'52	Plainfield, N.J.
Patterson, Joseph Vaughan	E.P.-June'52	York
Paul, William Peter, Jr.	Bus.-June'52	Philadelphia
Paules, Charles Elmer, Jr.	M.E.-June'52	Elizabeth, N.J.
Paulus, Harold Edward	Arts-June'51	Bethlehem
Paulus, Philip Edwin	I.E.-Feb.'49	Bethlehem
Pawlak, Edward Michael	M.E.-June'51	Flushing, N.Y.
Pawson, Robert Eugene	Bus.-June'51	Chatham, N.J.
Peabody, John Marion	G.C.D.	Pittsburgh
Peck, Ira Joel	Arts-June'51	Irvington, N.J.
Pecsek, Joseph	E.E.-June'49	Bethlehem
Peifer, Joseph Carl	E.E.-June'52	Ashland
Peiffer, Charles Calvin	Ch.E.-June'51	Tamaqua
Peil, Thomas Kuebler	Bus.-June'52	Easton
Pell, Samuel Harold	Chem.-Feb.'49	Lykens
Pellet, Bradford	Bus.-June'52	Summit, N.J.
Pennauchi, Carl John	Bus.-Feb.'49	Palmyra, N.J.
Pentland, Thomas Edward	Bus.-June'51	Wallingford, Conn.
Perenyi, Andrew Charles	Chem.-Feb.'50	New Brunswick, N.J.
Perry, Richard Allen	E.E.-June'52	West Collingswood, N.J.
Perry, Robert Elmer	Ch.E.-June'50	Verona, N.J.
Peter, Walter Ernst	Bus.-June'51	West Englewood, N.J.
Peterman, James Hunter	E.E.-June'52	Rockville Centre, N.Y.
Peters, John James	Bus.-June'51	Bethlehem
Peters, Melvin Edward	Bus.-Feb.'51	Bethlehem
Petersen, Jacob Edward	M.E.-June'49	Braintree, Mass.
Peterson, Matthew Bernard	Bus.-June'50	Wood-Ridge, N.J.
Peterson, Richard Clifford	Ch.E.-Feb.'50	Riegelsville, N.J.
Petrisky, Walter	I.E.-June'49	Allentown
Petrone, John James	M.E.-Feb.'49	Amsterdam, N.Y.
Pettit, Alfred Wells	Arts-Feb.'50	Caldwell, N.J.
Pettit, Robert Halsey	M.E.-Feb.'50	Manhasset, N.Y.
Pfeifer, Walter Edwin	Bus.-June'52	Maplewood, N.J.
Pflueger, John Christian	E.P.-June'51	North Miami, Fla.
Phair, Donald Norman	M.E.-June'51	West Orange, N.J.
Pharo, Robert Sharpless	Arts-Feb.'50	Bethlehem

Philipp, Warren Henry	Ch.E.-June'50	Queens Village, N.Y.
Philips, Harry Kirtland	Arts-June'52	Glen Ridge, N.J.
Phillips, Allen Ronald	Arts-June'49	Scranton
Phillips, Howard Watson, Jr.	Bus.-June'50	Chevy Chase, Md.
Phillips, Joseph James	M.E.-Feb.'50	Mount Carmel
Phillips, Lee Wolfe	Bus.-Feb.'49	Allentown
Phillips, Robert Lisle	I.E.-June'51	Manhasset, N.Y.
Pickens, Harley Lester	I.E.-June'50	Baldwin, N.Y.
Pierok, Walter Alexander	Bus.-June'49	Bethlehem
Pierson, James Harper Starr	Arts-Feb.'51	Wilmington, Del.
Pile, Sydney Thomas, Jr.	M.E.-June'49	Bethlehem
Pilling, Paul Miller	Bus.-Feb.'52	Philadelphia
Pitsilos, George Abraham	Arts-June'52	Bethlehem
Plankenhorn, Andrew Robert	Bus.-June'52	Merchantville, N.J.
Plonko, Joseph, Jr.	Chem.-Feb.'49	Scranton
Plourde, Joseph Clifford	Bus.-Feb.'49	Houlton, Me.
Plum, Russell Victor	Met.E.-Feb.'52	Philadelphia
Plumb, John Halifax	Arts-June'49	Bethlehem
Pociluyko, Alex	Chem.-Feb.'49	Palmerton
Pociluyko, Joseph	I.E.-Feb.'50	Palmerton
Pociluyko, Michael	E.E.-Feb.'50	Palmerton
Pociluyko, Stephen	M.E.-Feb.'50	Hampton, Va.
Podell, Charles Lloyd	Arts-June'52	Brooklyn, N.Y.
Poindexter, Emmett Williamson, Jr.	Ch.E.-June'51	Rutherford, N.J.
Polhemus, William DeWitt	Arts-Feb.'49	Bethlehem
Polinak, Donald	I.E.-Feb.'50	Shamokin
Pollitt, Douglas Bertron	M.E.-June'52	Interlaken, N.J.
Pollock, Russell Miles	Arts-June'51	Short Hills, N.J.
Pomeroy, John Seltzer	Arts-June'51	Bethlehem
Pongracz, Joseph Charles	Arts-June'51	Bethlehem
Pontier, Charles Francis	I.E.-June'50	Great Notch, N.J.
Poole, Davis Thomas, Jr.	I.E.-June'49	Rockville Centre, N.Y.
Pooley, Thomas Rickett	Ch.E.-June'50	Newton, N.J.
Pope, Edward Macrae	Bus.-June'51	North Plainfield, N.J.
Pope, Robert Charles	E.E.-June'50	Coopersburg
Popson, Andrew Thomas	Arts-Feb.'52	Freeland
Porraro, Pellegrino Patsy	Bus.-June'49	Glen Rock, N.J.
Porter, Frederick Meredith	Bus.-June'50	Moylan
Porter, Gerald Lewis	Ch.E.-June'52	Berwick
Porter, Walter James	Ch.E.-June'52	Whitestone, N.Y.
Porter, William Wilson, Jr.	I.E.-June'49	Clifton, N.J.
Portz, Frederick Evans, Jr.	I.E.-June'49	Arlington, N.J.
Portz, Richard Edwin	I.E.-June'50	Arlington, N.J.
Post, Donald Quentin	Bus.-June'50	Bloomfield, N.J.
Post, Glenn Irving	Ch.E.-June'50	Bethlehem
Post, William Greer, Jr.	Bus.-Feb.'49	Bloomfield, N.J.
Postetter, David Edward, Jr.	E.E.-June'49	Reading
Potochney, George John	E.E.-June'50	Freeland
Potosky, Walter Victor	C.E.-Feb.'49	Clifton, N.J.
Potter, William Douglas	Bus.-Feb.'50	Brielle, N.J.
Potts, Phillip Edward	Ch.E.-Feb.'49	Quakertown
Potts, Robert Allan	Ch.E.-Feb.'52	LaGrange, Ill.
Powell, Donald Mudge	Bus.-June'51	Phoenixville
Powers, Berri Grove	E.E.-Feb.'52	Pittsburgh

Pradetto, Richard Valentino	Arts-June'52	North Bessemer
Pray, Reuel Ford III	C.E.-June'50	Bronxville, N.Y.
Preis, Otto Henry, Jr.	Ch.E.-Feb.'50	Philadelphia
Prelle, Walter Valentin	Bus.-June'49	Old Greenwich, Conn.
Pressler, James MacDonald	M.E.-June'49	Harrisburg
Prest, Alan Patrick Llewellyn	Bus.-Feb.'52	Darien, Conn.
Price, Donald Kent	C.E.-June'51	Perkasie
Price, Maurice Sidney	E.E.-Feb.'50	Glen Rock, N.J.
Price, Richard Taylor	Arts-June'51	Perkasie
Prigge, Robert Wallace	C.E.-June'52	Plainfield, N.J.
Pritulsky, Peter Paul	M.E.-June'50	Bethlehem
Prosswinner, Paul Edmund, Jr.	M.E.-June'51	Great Neck, N.Y.
Pschorr, Frank Eric	Arts-Feb.'49	Freeport, N.Y.
Puckett, William, Jr.	Arts-June'52	Bethlehem
Pukansky, John Joseph	Bus.-June'51	Bethlehem
Pullar, Walter Samuel	Met.E.-June'52	Jenkintown
Pullen, William Earl	E.E.-June'52	Asbury Park, N.J.
Purdy, Edmund James	Arts-June'52	Drexel Hill
Purdy, William Starr	Bus.-Feb.'51	Englewood, N.J.
Puth, John Wells	Bus.-June'52	Maplewood, N.J.
Pysher, Dale Charles	I.E.-Feb.'50	Bethlehem

Quick, Allen Nodine	Arts-June'51	Glen Ridge, N.J.
Quigg, John Thomas	Arts-June'52	Clarks Summit
Quillman, Richard Earl	I.E.-June'52	Philadelphia
Quinn, Halsey Paul	E.E.-June'50	East Orange, N.J.

Rabenold, Anson Edwin	Bus.-June'50	Allentown
Raff, Richard Davis, Jr.	Bus.-June'51	Canton, Ohio
Raffensperger, George Taylor, Jr.	I.E.-June'49	Gettysburg
Raffetto, Theodore John	Bus.-June'49	Brooklyn, N.Y.
Rahmes, Gordon Roswell	Bus.-Feb.'49	Rutherford, N.J.
Raidline, Clifford Thomas	I.E.-June'49	Bethlehem
Raiff, Frederic Kaufman	Bus.-Feb.'49	New York, N.Y.
Raine, John Wesley	Arts-June'52	Salem, N.J.
Rak, Charles Walter	M.E.-June'49	Trenton, N.J.
Rakochy, Andrew	Arts-Feb.'50	Allentown
Ralph, Richard Arthur	Arts-Feb.'49	Summit, N.J.
Ralston, Robert Hunter	I.E.-June'49	Pittsburgh
Ramball, Denis L.	Bus.-June'50	Bethlehem
Rambert, Gordon Arthur	Bus.-June'49	Rochester, N.Y.
Ramsey, Harry Bohlin	Arts-June'50	Davenport, Iowa
Randall, Neil Coulter	E.E.-June'52	Harrisburg
Randolph, John Montgomery	Arts-June'51	Rahway, N.J.
Rankin, John Robert	I.E.-Feb.'51	Washington
Ransohoff, Jackson Arthur	Ch.E.-Feb.'50	Glenbrook, Conn.
Rappa, Joseph	Arts-June'50	Bethlehem
Rashmir, Lewis Irwin	I.E.-June'49	Redlands, Calif.
Rathbone, Ludlow Hall	Bus.-June'52	Woodmere, N.Y.
Rauch, Freedel Alfred	Bus.-Feb.'50	Orlando, Fla.
Rauhe, Bruce Robert	M.E.-June'52	Daytona Beach, Fla.
Read, Edwin Nelson	Arts-June'49	York
Read, Leiper Patterson, Jr.	E.E.-Feb.'50	Pottsville
Read, Michael Dean	Ch.E.-June'50	York
Reber, John, Jr.	M.E.-Feb.'49	Reading

Reber, Luther	M.E.-June'50	Reading
Reber, Ralph Richard	Bus.-June'49	Sellersville
Red, Deonicy Samuel	M.E.-Feb.'50	Harrisburg
Redel, Walter Joseph	Arts-June'51	Waverly
Redlien, Robert Donald	C.E.-Feb.'50	Ozone Park, N.Y.
Reed, Charles Wayne	M.E.-June'51	Shamokin
Reed, Glenn Eugene	M.E.-Feb.'52	Loysville
Reed, Horace III	I.E.-June'50	Lake View, N.Y.
Reed, James Chenoweth	Bus.-June'52	Scarsdale, N.Y.
Reed, Robert Bruce	Ch.E.-Feb.'50	Kintnersville
Reehl, Robert Frederick	Ch.E.-Feb.'50	Orlando, Fla.
Reese, Elmer Edward	M.E.-June'52	Wilkes-Barre
Reese, Willard Ambrose	I.E.-Feb.'49	Bethlehem
Reetz, Carl Godfried, Jr.	C.E.-June'50	Fleetwood
Regar, Donald Arthur	E.E.-June'52	Reading
Rehner, William David	Bus.-June'52	Rutherford, N.J.
Rehnert, Karl Joseph	E.E.-June'49	Pottsville
Rehrig, Allen Wilson	I.E.-June'49	Palmerton
Reichard, William Bruce	Ch.E.-Feb.'52	Reading
Reid, Alfred William, Jr.	Arts-Feb.'51	Teaneck, N.J.
Reid, Robert Alexander	Arts-June'52	Englewood, N.J.
Reid, Thomas	M.E.-Feb.'49	Irvington, N.J.
Reiff, Harry Elmer	Ch.E.-Feb.'49	Allentown
Reilly, Jack Patrick	Arts-June'50	Bethlehem
Reimer, James Brooks	Ch.E.-June'51	Cleveland, Ohio
Reimuller, Louis Peter, Jr.	Arts-Feb.'51	Richmond Hills, N.Y.
Rein, George Charles, Jr.	E.P.-Feb.'51	Trenton, N.J.
Reinbrecht, Charles Henry, Jr.	M.E.-Feb.'50	Souderton
Reinhard, Myron Ambrose, Jr.	I.E.-Feb.'49	Allentown
Reinhart, Bruce Lloyd	Arts-June'52	Reading
Reinhart, Paul Earl	Bus.-June'49	Tamaqua
Reinhold, J. William	E.E.-June'52	Harrisburg
Reinhold, William Harper, Jr.	Arts-June'52	Allentown
Reinke, Theodore	Ch.E.-June'52	Cambridge, Md.
Reisman, Robert David	Bus.-June'52	New York, N.Y.
Reitzel, Nicolas Martin	M.E.-Feb.'51	Merion
Remley, George Carter	Bus.-June'51	Allentown
Remmey, Frank Wolstencroft	Bus.-June'52	Philadelphia
Renfro, Richard Mack	C.E.-June'52	Allentown
Renninger, John Hartman	I.E.-Feb.'49	Shillington
Reppert, Byron Liebold	Arts-June'51	Reading
Reppert, Richard Templin	Arts-June'52	Bethlehem
Ressler, Frederick Eugene	Arts-June'52	Allentown
Ressler, Ivon Roy, Jr.	Bus.-June'50	Harrisburg
Restrepo, Rodrigo Alvaro	C.E.-June'51	Washington, D.C
Reynolds, Jay Walter	E.E.-June'52	Peckville
Rhoad, Robert Rodney, Jr.	Bus.-Feb.'52	Philadelphia
Ricapito, Joseph Dominic	Arts-Feb.'52	Bethlehem
Rice, William Schaeffer	Arts-June'51	Tamaqua
Richards, Arthur Samuel	E.E.-Feb.'50	Montrose
Richards, Elmer Arthur	C.E.-June'51	Somerville, N.J.
Richards, John Stuart	M.E.-June'49	Havertown
Rickard, Eric Martyn, Jr.	E.E.-June'49	Morristown, N.J.
Rickner, Robert Howard	E.E.-June'49	Roslyn
Rider, Donald Clarence	Arts-June'52	Hanover

Rider, Edmund Samuel	Met.E.-June'50	Euclid, Ohio
Rider, Frederick Warren	Bus.-Feb.'52	Westfield, Mass.
Ridinger, Charles Wesley III	Bus.-June'50	Pittsburgh
Ridinger, Philip Gehr	E.E.-Feb.'50	Gettysburg
Ridler, Thomas Armstrong	M.E.-June'50	Wilmington, Del.
Ridler, William Jenner	M.E.-June'50	Wilmington, Del.
Ridyard, Herbert William	M.E.-June'49	Bethlehem
Riegel, Robert Welty	Arts-June'51	Catasauqua
Rieker, Walter Charles	I.E.-June'49	Bala-Cynwyd
Rigney, William John	C.E.-Feb.'50	Flushing, N.Y.
Rile, Thomas Henry	C.E.-June'49	Springfield
Riley, Francis Stevenson	Arts-June'50	Bethlehem
Riley, Gilbert Bahr	Bus.-Feb.'49	Maplewood, N.J.
Rinker, Robert Norton	E.E.-June'49	Nazareth
Riola, George Lawrence	Bus.-June'52	Bethlehem
Rippe, Jack William	Arts-June'50	Long Island City, N.Y.
Rissinger, Harry Andrew	C.E.-June'49	Pottsville
Ritchey, Robert Toomey	Bus.-June'52	Easton
Rittenhouse, Karl David	E.P.-June'49	Shavertown
Ritter, Myron Wayne	Arts-Feb.'51	Bethlehem
Ritter, Richard Malcolm	Bus.-June'51	Allentown
Rittmann, Albert Deitz	E.P.-June'50	Trenton, N.J.
Rittmann, William Gottlieb	E.E.-June'50	Trenton, N.J.
Roach, Thomas Aloysius, Jr.	Met.E.-June'52	Bethlehem
Roba, John Joseph	M.E.-Feb.'51	Coopersburg
Robb, Andrew Donaldson III	Arts-June'51	Pittsburgh
Robbins, Edwin Hayes	Chem.-June'52	Catasauqua
Robel, Wayne Edward	C.E.-June'51	Johnstown
Roberson, James Harvey	I.E.-June'49	Essex Fells, N.J.
Roberts, Carlyle Jones, Jr.	E.P.-June'50	Jenkintown
Roberts, Charles Harold	Arts-Feb.'50	Bethlehem
Roberts, Harmar Denny, Jr.	Bus.-June'52	Bryn Mawr
Roberts, Paul Myron	Bus.-June'49	Rockville Centre, N.Y.
Robinson, Charles Leigh	E.E.-June'49	Penns Grove, N.J.
Robinson, George Pearse III	Bus.-June'52	Short Hills, N.J.
Robinson, John David	Bus.-June'50	Garden City, N.Y.
Robinson, Kenneth Owen	Met.E.-June'50	Bethlehem
Robinson, Marvin	E.E.-June'52	Kew Gardens, N.Y.
Rodale, Robert David	Arts-June'51	Allentown
Rodham, Donald George	C.E.-June'52	Scranton
Roepe, Edward Schweyer	I.E.-Feb.'51	East Williston, N.Y.
Roethke, Frederick Julius Henry	C.E.-June'49	Bethlehem
Rogers, Harold Goodman	E.E.-June'49	Reading
Rogers, Ryland Fuller	E.M.-Feb.'52	Harrington Park, N.J.
Rohall, John, Jr.	Ch.E.-Feb.'50	Coaldale
Rohn, Russell Albert	Bus.-Feb.'49	Nazareth
Rohrbach, Carl David	E.E.-June'49	Mertztown
Rohrbach, Richard Raymond	Ch.E.-June'50	West Reading
Roll, John Belzer, Jr.	E.E.-June'51	Plainfield, N.J.
Rolle, Alan Paul	E.E.-Feb.'50	Philadelphia
Rollins, Lester Leroy	Bus.-Feb.'50	Whitinsville, Mass.
Rometsch, Robert William	Bus.-Feb.'51	Philadelphia
Romig, Edward Ramsay	Arts-June'52	Allentown
Ronci, Will Lionel	E.P.-June'50	Allentown
Rondinella, Nicholas Joseph	M.E.-June'49	Wilkes-Barre

Ronemus, Morris Robert	M.E.-June'51	Lehighton
Roppel, Richard Meredith	Arts.-Feb.'51	Tamaqua
Rosch, Francis Clifford, Jr.	M.E.-June'51	Harrisburg
Rose, Thomas Allan	M.E.-Feb.'51	E. Grand Rapids, Mich.
Roseman, Lawrence Joseph	M.E.-June'50	Devon, Conn.
Rosen, Bernard Robert	Bus.-June'50	Somerville, N.J.
Rosenbaum, Edward Whitehill	Arts-June'49	Elkins Park
Rosendale, Robert Matthew	M.E.-Feb.'50	Mount Carmel
Rosier, Charles Evans	Bus.-June'51	New Freedom
Roth, Norman Harold	Met.E.-June'49	Allentown
Roth, Richard Bruce	E.E.-June'49	Reading
Rotolo, Elio	I.E.-June'49	Brooklyn, N.Y.
Rotzell, Quintus Henry, Jr.	M.E.-June'50	Nazareth
Rowe, Thomas Henry	E.E.-Feb.'50	Bethlehem
Rowntree, Charles Kenneth	Bus.-June'49	Arlington, Mass.
Roxberry, Richard Charles	E.E.-June'51	Allentown
Royce, Robert Farnham	Arts-June'52	Rutherford, N.J.
Royer, John William	M.E.-Feb.'49	Camp Hill
Royer, Richard Alan	Arts-Feb.'50	Westfield, N.J.
Rubel, Gordon Richardson	Met.E.-June'50	Great Neck, N.Y.
Ruberstein, Albert Harold	I.E.-June'49	Philadelphia
Rucki, Daniel Henry	E.E.-June'49	Newark, N.J.
Rudd, David Dalton	Bus.-June'51	Bethlehem
Rudelitsch, Arthur Elwood	Bus.-June'51	Lehighton
Rudnicki, John Walter Francis	C.E.-Feb.'49	Plymouth
Rudolph, Burton George	E.E.-June'50	Bethlehem
Rudolph, Philip	Bus.-June'52	Mount Vernon, N.Y.
Ruestow, Edward Henry, Jr.	M.E.-June'52	Maplewood, N.J.
Rumbarger, John Hendrickson	M.E.-June'49	Margate, N.J.
Rush, Harris Stockton	M.E.-June'50	Westfield, N.J.
Rushton, Alvey Bertan	E.M.-Feb.'50	New Kensington
Rusling, William Edward	Bus.-June'51	Kenvil, N.J.
Russell, John Arthur, Jr.	E.E.-June'49	Mount Vernon, N.Y.
Russell, John Gilbert	E.M.-June'51	Beacon, N.Y.
Russell, Marcus Holmes	Ch.E.-Feb.'50	Toms River, N.J.
Rust, David McElroy	Bus.-June'50	New Brunswick, N.J.
Rutherford, John Brisbin	C.E.-Feb.'49	Harrisburg
Rutkowski, Charles Henry	Bus.-June'52	Utica, N.Y.
Rutter, Harry Paul, Jr.	Bus.-June'52	Lancaster
Ryerson, David Walter	Ch.E.-June'52	Wyckoff, N.J.

Sadler, Daniel, Jr.	M.E.-Feb.'51	Philadelphia
Sailor, Robert Allen	Ch.E.-June'51	Drexel Hill
Sakovics, Julius	E.P.-June'52	Bethlehem
Salem, Andrew Gerard, Jr.	Ch.E.-June'52	West Orange, N.J.
Saltzman, Murray	Bus.-Feb.'50	Allentown
Sammak, Douglas Michel	E.M.-Feb.'49	Elmira, N.Y.
Samuels, Steven Albright	Bus.-June'51	New York, N.Y.
Samuels, William Paul	Chem.-June'50	Kearny, N.J.
Sanborn, Robert Pierce, Jr.	Bus.-June'50	Essex Fells, N.J.
Sanchez, Adolfo Oliverio	M.E.-Feb.'52	Camaguey, Cuba
Sanchini, Dominick Joseph	M.E.-June'51	Raritan, N.J.
Sanders, Robert Louis	M.E.-June'49	New Cumberland
Sanderson, Donald Munro	Bus.-June'50	Maplewood, N.J.
Sandwick, Charles Martin, Jr.	Arts-June'50	Easton

Saraydar, Richard Armen	E.E.-June'51	East Orange, N.J.
Saricks, Joseph Charles	I.E.-June'49	Freeland
Sasse, Ferdinand Charles	I.E.-Feb.'49	Allentown
Saulsbury, Albert Orrell, Jr.	I.E.-June'49	Ridgely, Md.
Saum, James Arthur	Arts-June'49	Evansville, Ind.
Saunders, Harold Kennessaw	Chem.-Feb.'50	Baldwin, N.Y.
Saunders, Melvin Samuel	Met.E.-June'49	Chambersburg
Savage, David Thomas	Arts-June'51	Reading
Savastio, Leonard Anthony	M.E.-June'49	Havertown
Savopoulos, Michael Demetrios	G.C.D.	Bethlehem
Savory, Donald Wilson	Arts-June'51	Oreland
Sawhill, Malcolm Campbell	Bus.-Feb.'50	Highlands, N.J.
Sawruk, Stephen	Chem.-June'50	Allentown
Saxtan, Robert Eugene	Ch.E.-Feb.'52	Westfield, N.J.
Saydah, Ferris Murad, Jr.	Bus.-June'50	Tenafly, N.J.
Saydah, Harold Murad, Jr.	Bus.-June'51	Tenafly, N.J.
Scalzi, Francis Paul	Bus.-June'50	Meriden, Conn.
Scannella, Joseph Louis	Arts-June'51	Clifton, N.J.
Scarr, Robert Francis	Chem.-June'52	Fair Lawn, N.J.
Scattene, Frank Anthony, Jr.	M.E.-Feb.'51	Bethlehem
Schaefer, Joseph Bernard	Bus.-June'50	Quakertown
Schaeffer, Forrest Grim	Arts-Feb.'51	Macungie
Schaeffer, Paul Richard	M.E.-June'49	Bethlehem
Schaffnit, William Edward, Jr.	M.E.-June'51	Springfield
Schantz, John Thomas	M.E.-June'52	South Bend, Ind.
Schaphorst, Richard Allan	I.E.-June'52	Atlantic Highlands, N.J
Scharfenberg, Frank Eugene	C.E.-Feb.'51	Lynbrook, N.Y.
Schautz, John Louis, Jr.	Bus.-Feb.'49	Scranton
Scheff, Robert	Bus.-June'52	Hempstead, N.Y.
Scheirer, Russell E., Jr.	I.E.-June'50	Fullerton
Scheller, George Ernest	M.E.-June'49	Hackettstown, N.J.
Schenck, Richard Clark	I.E.-Feb.'52	Reading
Schepps, Elihu Meyer	Chem.-June'52	Fair Lawn, N.J.
Scherff, William Anders	Ch.E.-June'52	Mamaroneck, N.Y.
Schierloh, James Edward	Bus.-June'51	Hackensack, N.J.
Schiff, Herbert	Bus.-June'51	Mount Kisco, N.Y.
Schimmel, Thomas William	I.E.-Feb.'50	Bethlehem
Schirick, Robert John	Ch.E.-June'52	Haworth, N.J.
Schissler, Melvin	Bus.-June'49	Quakertown
Schlecht, William Powers	M.E.-June'52	Hackettstown, N.J.
Schlegel, Donald Paul	Bus.-June'50	Allentown
Schlegel, Earl Wesley Stauffer	E.P.-June'51	Bechtelsville
Schlichter, Ernest Stanley	E.E.-June'50	Allentown
Schlictmann, Fred Louis	C.E.-June'52	Flushing, N.Y.
Schlottman, Alfred William	Arts-Feb.'50	Hillsdale, N.J.
Schmick, William George	E.E.-June'49	Harrisburg
Schmidt, Albert Joseph	M.E.-June'49	Bloomfield, N.J.
Schmidt, Richard Donald, Jr.	Bus.-June'52	Bound Brook, N.J.
Schmitt, Edward Tobias	M.E.-Feb.'52	New York, N.Y.
Schmitt, Paul Joseph	Ch.E.-June'49	Kingston
Schmitt, Stanley William	Chem.-June'51	Ridgewood, N.J.
Schnall, Herbert Kenneth	Bus.-June'50	Brooklyn, N.Y.
Schneider, Arnold Charles	M.E.-June'51	North Bergen, N.J.
Schneider, Paul Frederick	M.E.-June'49	Lancaster
Schneiders, Francis Anthony	Ch.E.-Feb.'50	Plainfield, N.J.

Schneiders, John Martin	I.E.-Feb.'51	Plainfield, N.J.
Schnell, John Bainbridge	M.E.-June'51	Philadelphia
Schoenberger, Morton Wayne	E.E.-June'49	Lehighton
Scholtes, Donald Roy	E.E.-June'52	Wyckoff, N.J.
Scholz, Frank Herbert	Met.E.-June'51	Maplewood, N.J.
Schott, Richard Ray	Met.E.-June'51	Atlantic City, N.J.
Schrader, Walter Charles Alsop	Ch.E.-Feb.'50	Garden City, N.J.
Schragger, Alan Harvey	Arts-June'52	Trenton, N.J.
Schrayer, Grover Jacob	Chem.-June'50	Bethlehem
Schrenk, Frank Henry	I.E.-June'51	San Clemente, Calif.
Schryber, Emil John	I.E.-June'50	Lynbrook, N.Y.
Schubert, David Crawford	E.P.-June'49	Shillington
Schubert, Rudolph George	Arts-Feb.'51	Easton
Schuler, William Wesley	Arts-June'52	Larksville
Schultz, Hyman Henry	Bus.-Feb.'49	Allentown
Schulz, Albert Edward	E.E.-June'51	Bridgeport, Conn.
Schwab, Anthony Wayne	Arts-Feb.'50	Washington, D.C.
Schwab, Paul Edward	E.E.-Feb.49	Atlantic City, N.J.
Schwartz, Roland Joseph, Jr.	C.E.-Feb.'50	Cupsaw Lake, N.J.
Schwartzberg, Harold Lee	E.E.-June'50	New York, N.Y.
Schwarz, Alfred Otto	M.E.-June'49	Morris Plains, N.J.
Schwarz, Theodore George III	E.E.-June'49	Dunellen, N.J.
Schweitzer, Fred Max	E.P.-June'52	Hartsdale, N.Y.
Schwepfinger, Charles Guth	Chem.-Feb.'51	Allentown
Scott, John Walker	Ch.E.-June'51	Philadelphia
Scriptunas, Vito Anthony	I.E.-June'50	Scranton
Scrobe, Daniel Victor	I.E.-June'50	Reading
Scully, Oliver Francis Thomas	M.E.-June'52	Brockway
Seal, Gill Evans	Bus.-June'51	Tenafly, N.J.
Search, Stacy Marion	E.E.-June'52	Berwick
Searfoss, William Harry	Arts-Feb.'49	Trenton, N.J.
Searle, William Evans	Bus.-June'51	Aberdeen Proving Ground, Md.
Seasholtz, Peter Brant	M.E.-June'52	Wyomissing
Seavey, John Paul	C.E.-June'50	Glen Ridge, N.J.
Seebald, Francis Warren	Bus.-Feb.'51	Allentown
Seeger, Herbert Ludwig, Jr.	Bus.-June'49	Manhasset, N.Y.
Segraves, John Walter	Ch.E.-June'49	Long Branch, N.J.
Segui, Charles Joseph	Bus.-June'51	Great Neck, N.Y.
Seibel, James Howard	Bus.-Feb.'52	Trenton, N.J.
Seidenberger, August Aloysius, Jr.	Bus.-June'52	Bethlehem
Seidler, Robert Jacques	Ch.E.-June'52	Richmond Hill, N.Y.
Seifart, Curt	Bus.-Feb.'49	Charlotte, N.C.
Seifert, Rodman Harvey	Bus.-Feb.'51	Bethlehem
Seiler, Michael Herman	M.E.-June'52	Bethlehem
Seim, Norman John	Bus.-Feb.'50	South Orange, N.J.
Seip, William Ellis	Arts-June'52	Allentown
Sell, Frederick Paul	Bus.-Feb.'49	Allentown
Seman, Andrew Edward	E.E.-June'52	Hiller
Senkowski, Walter Theodore	M.E.-June'49	Philadelphia
Sentz, Robert Eugene	Bus.-Feb.'51	Littlestown
Serman, Richard Charles	Arts-Feb.'49	Bethlehem
Sertl, Alfred Floyd	Bus.-June'49	Valley Stream, N.Y.
Seville, John Bergdoll	M.E.-June'52	York

Sgambelluri, Frank Joseph	E.E.-June'52	Paterson, N.J.
Shackelford, Edwin Donald	E.E.-June'49	South Sudbury, Mass.
Shackles, Robert Andrew	Arts-June'51	Wilkes-Barre
Shaffer, William Andrew	Ch.E.-June'50	Oil City
Shaheen, Nodine Peter	Chem.-Feb.'50	Easton
Shannahan, Thomas Day, Jr.	Arts-June'52	Bethlehem
Shaputnic, Frank George	Bus.-June'49	Allentown
Sharkan, William Walter	Arts-June'52	Bethlehem
Sharpe, Robert Dana	Chem.-Feb.'52	Morristown, N.J.
Sharpell, Frederick Hoose, Jr.	Arts-Feb.'50	Hollis, N.Y.
Sharpless, Richard Baldy	E.E.-June'49	Catawissa
Shaughnessy, Francis Xavier	Bus.-June'52	Shenandoah
Shaver, North Clarence, Jr.	I.E.-June'49	Johnstown
Shaw, Dudley Peter	Met.E.-June'52	Plainfield, N.J.
Shaw, John Edward	M.E.-Feb.'50	Jamestown, N.Y.
Shaw, Willard Rogers	E.E.-Feb.'51	Kingston
Shea, James Joseph, Jr.	Bus.-Feb.'50	Hartford, Conn.
Shearer, John Garrard	I.E.-June'49	Pittsburgh
Sheldon, Dunstan Pennell	Bus.-Feb.'50	Hudson, Ohio
Shelton, Charles Talbert	E.E.-June'52	West Hartford, Conn.
Sheriff, Owen George	I.E.-June'50	Bethlehem
Sherman, Richard Ralph	Arts-June'52	Highland Park, N.J.
Shermer, David Alan	Ch.E.-Feb.'49	Philadelphia
Sherwood, Kenneth Wesley	Bus.-June'49	Englewood, N.J.
Shimkanon, Joseph Richard	Bus.-June'52	Northampton
Shipley, Samuel Hunt, Jr.	M.E.-June'51	York
Shirk, Thomas Franklin	C.E.-June'51	Lancaster
Shockcor, Joe Houser	Ch.E.-Feb.'50	Allentown
Shoemaker, Charles Lesser	C.E.-June'52	Pittsburgh
Shoemaker, Lawrence	Bus.-June'49	Baltimore, Md.
Shultz, James Richard	M.E.-Feb.'50	Washington Boro
Shuman, Robert Evans	Arts-June'51	Scranton
Shute, Richard Morgan	C.E.-June'51	Mountain Lakes, N.J.
Shuttleworth, Edwin	I.E.-Feb.'51	Douglaston, N.Y.
Shymon, Stephen John	Chem.-June'49	Jersey City, N.J.
Sickler, Joseph Benjamin	Arts-June'49	Fort Pierce, Fla.
Sideris, Homer Geri	Arts-June'49	Bethlehem
Siebecker, Walter Louis	Bus.-June'52	Bethlehem
Siegel, Herbert Jay	Arts-June'50	Philadelphia
Sievering, Philip John	Ch.E.-June'52	Maplewood, N.J.
Siftar, Robert	E.E.-June'49	Bethlehem
Silliman, Vian Bertram, Jr.	I.E.-Feb.'49	Allentown
Simmons, Ross Long	C.E.-Feb.'52	Lancaster
Simpson, John Francis, Jr.	E.E.-June'52	Little Silver, N.J.
Singley, Wilbur James, Jr.	Ch.E.-Feb.'49	Emmaus
Sippach, Richard William	E.E.-June'50	Maplewood, N.J.
Skillman, William Alfred	E.P.-June'52	Toms River, N.J.
Skorinko, George	E.P.-June'52	Palmerton
Slater, Charles Augustus, Jr.	Bus.-Feb.'49	Havertown
Slater, Robert Lees	M.E.-Feb.'51	Havertown
Slemmer, James Richard	Ch.E.-June'49	Haddon Heights, N.J.
Sloan, Gurney Poulson, Jr.	E.E.-June'52	Bryn Mawr
Slone, Leo William	C.E.-June'52	Bradford
Smalley, Walter Rupert	Met.E.-June'50	Bethlehem
Smeal, Harry William	Ch.E.-June'52	Pittsburgh

Smeloff, Richard Konstantin	I.E.-June'50	Allentown
Smilek, Stephen William	E.E.-June'52	Allentown
Smith, Albert Joseph	I.E.-June'49	Mineola, N.Y.
Smith, Alexander Forbes III	M.E.-June'50	Reading
Smith, Charles Parvin, Jr.	M.E.-Feb.'50	Williamsport
Smith, Clyde Wilson	M.E.-Feb.'49	Parkersburg, W.Va.
Smith, Donald Charles	Bus.-June'51	Bethlehem
Smith, Donald Edward	Arts-June'52	Haddon Heights, N.J.
Smith, Earl Leslie	M.E.-Feb.'50	Honesdale
Smith, Francis Bernard	E.E.-June'52	Wilkes-Barre
Smith, Franklin Harrison, Jr.	I.E.-Feb.'50	Berlin, Mass.
Smith, Harvey Alvin	Chem.-June'52	Reading
Smith, Henry Cranston	I.E.-June'51	Bryn Mawr
Smith, Horace Rodman	Ch.E.-Feb.'50	Margate, N.J.
Smith, James Andrew	Arts-Feb.'50	Northampton
Smith, James Corson	Bus.-Feb.'50	South Orange, N.J.
Smith, James Edgar	Arts-June'50	Riegelsville
Smith, Joe Andrew, Jr.	Bus.-Feb.'49	Hellertown
Smith, John Edward	M.E.-June'49	Hatboro
Smith, Lawrence Alexander	I.E.-Feb.'51	Bradford
Smith, Martin Byron	Bus.-Feb.'51	Pittsburgh
Smith, Richard Allen	C.E.-June'52	Bethlehem
Smith, Richard Seth, Jr.	Met.E. June'52	Buffalo, N.Y.
Smith, Robert Langland	E.M.-June'50	Ridgewood, N.J.
Smith, Robert Vincent, Jr.	Bus.-June'49	Irvington, N.J.
Smith, Roland Young	C.E.-Feb.'50	York
Smith, Warren Leroy	Bus.-June'49	Floral Park, N.Y.
Smith, Wesley Richard	E.P.-Feb.'50	Allentown
Smith, William Hutchinson	E.E.-June'52	Pittsburgh
Smith, William Layton	Bus.-Feb.'50	Plainfield, N.J.
Smolowe, Richard Edward	Bus.-June'50	New York, N.Y.
Smoyer, Ralph Mosser	I.E.-June'49	Allentown
Smoyer, Thomas Edwin	I.E.-June'51	Allentown
Snowden, Laird Reese	M.E.-Feb.'49	Paoli
Snyder, Ernest Mayo	Arts-June'52	Plainfield, N.J.
Snyder, Frederick Henry	Ch.E.-Feb.'50	Lansdowne
Snyder, Martin Luther	Arts-June'52	Bethlehem
Snyder, Merritt Elwood	I.E.-June'49	Allentown
Snyder, Richard John	I.E.-June'50	West Orange, N.J.
Snyder, Richard William	E.E.-Feb.'50	Manila, P.I.
Snyder, William Earl	Bus.-Feb.'51	Palmerton
Snyder, William Tredway	E.E.-June'49	Carlisle
Solis, David Hays, Jr.	Bus.-June'49	Elkins Park
Solly, Joseph Birchall	Ch.E.-Feb.'49	Harrisburg
Solt, Paul Erwin	M.E.-June'50	Allentown
Soltau, Richard Heilbron	E.E.-June'51	Sellersville
Somers, Donald Charles	I.E.-Feb.'49	Berkley, Mich.
Sorrentino, Patrick	E.E.-June'49	Allentown
Soule, Lawrence Clement, Jr.	Bus.-June'49	Essex Fells, N.J.
Spalding, George Redfield	C.E.-June'52	Cranford, N.J.
Spalding, Richard William	Arts-Feb.'50	Allentown
Spangler, Grant Edward	Met.E.-June'50	Lebanon
Spangler, Henry Andrew	I.E.-June'50	Scarsdale, N.Y.
Spengler, Robert Clyde	Bus.-June'49	Northampton
Spengler, William Arthur	Bus.-June'50	Northampton

Sperr, Harold Evans	E.P.-June'51	Ringtown
Spescha, William Paul	Ch.E.-June'49	Philadelphia
Spies, Roderic Anthony	Met.E.-June'51	Upper Montclair, N.J.
Spillar, Ernest Hanus	I.E.-June'49	Forest Hills, N.Y.
Spilsbury, Hugh Gybbon, Jr.	Met.E.-June'50	Cranford, N.J.
Spinell, Donald Merrill	M.E.-June'51	Wilmington, Del.
Spinner, Thomas John	Arts-June'51	Brooklyn, N.Y.
Spirk, Bernard Richard	Bus.-June'51	Bethlehem
Spooner, William Henry	E.M.-June'51	Bethlehem
Spoor, Kenneth Franklin	Arts-June'49	Birmingham, Mich.
Sporleder, Andrae Buckley	Met.E.-Feb.'49	Wilson, N.Y.
Sprang, Edward Daniel	I.E.-June'50	Green Bay, Wis.
Springman, Eugene Robert	M.E.-Feb.'51	Philadelphia
Staats, Horace Wayne, Jr.	Bus.-June'52	Kennett Square
Staffieri, Benedict Francis	I.E.-Feb.'49	Bethlehem
Stafford, Leonard William	Bus.-June'52	Woodbridge, N.J.
Stahl, Robert Edward	C.E.-June'49	Shamokin
Stalknecht, David Owen	I.E.-Feb.'49	Westfield, N.J.
Stallings, John Paul	Arts-June'52	Lawrenceburg, Ind.
Stamm, Donald Erwin	Bus.-June'52	Mount Vernon, N.Y.
Stanier, John Stewart, Jr.	Bus.-June'51	Youngstown, Ohio
Stanton, Vincent Anthony, Jr.	Met.E.-June'49	Johnstown
Staring, Arthur Robert	I.E.-June'51	Mohawk, N.Y.
Stark, Frank Benjamin	Arts-June'50	Allentown
Starry, Christian Ferdinand	E.M.-June'52	Summit Hill
Stasewich, Fred John	Ch.E.-June'49	Maplewood, N.J.
Stasse, Albert Anthony	Bus.-June'52	Jackson Heights, N.Y.
Stauffer, Francis Eugene	E.E.-June'49	York
Stauffer, James Merle	Ch.E.-June'52	Hanover
Stauffer, Ray Franklin, Jr.	C.E.-June'49	Harrisburg
Stauffer, Richard Eugene	E.E.-June'51	Bethlehem
Steetle, David Ross	E.P.-June'52	Indiana
Stefanik, Gustave Richard	Chem.-June'51	Bethlehem
Steigerwalt, Bertine Brown	Bus.-Feb.'49	Bowmanstown
Stellato, Carmon John	M.E.-Feb.'51	Bethlehem
Stemler, Richard Stinson	Arts-June'49	Palmerton
Stephenson, Edward Thomas	Met.E.-June'51	Pleasantville, N.J.
Stern, Edwin Maxim, Jr.	Bus.-June'52	Briarcliff Manor, N.Y.
Sternberger, Robert Martin	I.E.-June'50	Glen Ridge, N.J.
Sterner, Charles James	Ch.E.-June'49	Bethlehem
Sterner, James Adam	C.E.-June'49	Egypt
Sterner, Paul Mitchell Walter	Arts-June'50	Bethlehem
Stetten, Kenneth Jay	E.P.-June'52	Bethlehem
Stevens, Robert Bennett	Bus.-June'49	Bronxville, N.Y.
Stevens, William Henry	Bus.-June'50	Great Notch, N.J.
Stevenson, John, Jr.	E.E.-June'51	Medford, Mass.
Stewart, Donald Speir, Jr.	Arts-June'50	South Orange, N.J.
Stewart, Gordon Bennett	I.E.-June'49	Woodbury, N.J.
Stewart, Hugh Russell, Jr.	Bus.-Feb.'49	Philadelphia
Stickell, David White	Arts-June'52	Sewickley
Stiles, Bradford Loring	Chem.-Feb.'49	Forest Hills, N.Y.
Stiles, Edward Carl Ernest	M.E.-Feb.'51	Bethlehem
Stiles, Richard Lehman	M.E.-June'50	Bethlehem
Stiles, Wilbur Barrington	Arts-June'50	Easton
Stiles, William Summerill	M.E.-June'52	Penns Grove,N.J.

Stillwell, Frederick Ely	Met.E.-June'50	Charlotte, N.C.
Stilwell, George Raymond	E.E.-June'51	Plainfield, N.J.
Stires, Donald Huntoon	C.E.-June'51	Somerville, N.J.
Stiver, Walter Joseph Crowder	M.E.-June'49	Philadelphia
Stockham, Herbert Cannon	I.E.-Feb.'49	Birmingham, Ala.
Stockman, Robert M.	Bus.-June'49	New York, N.Y.
Stoeltzing, Richard Wade	E.P.-June'50	Pittsburgh
Stoll, Fred Charles	C.E.-June'49	Pelham, N.Y.
Stoll, John Henry, Jr.	Ch.E.-June'51	Philadelphia
Stone, Andrew Waldron, Jr.	I.E.-Feb.'50	Garden City, N.Y.
Stone, Norman Louis	E.E.-June'50	Garden City, N.Y.
Storch, Clyde Junior	M.E.-June'49	Reading
Storch, Frederick Engler	Arts-Feb.'52	Catasauqua
Storrow, Richard Rhode	Arts-June'50	Allentown
Stotz, Norman Irwin, Jr.	Arts-June'52	Oakmont
Stout, Henry Walter, Jr.	M.E.-Feb.'50	Bethlehem
Stowers, Harry Wesley	M.E.-June'52	Bluefield, W.Va.
Straub, Wells Williamson	E.E.-June'52	Teaneck, N.J.
Straussberg, Arthur	Arts-June'52	South Orange, N.J.
Strecker, Henry Anthony III	Arts-June'52	Bayshore, N.Y.
Streit, Peter Louis	Ch.E.-June'52	South Nyack, N.Y.
Stritzinger, Lee Marshall	Bus.-Feb.'51	Scarsdale, N.Y.
Strohl, George Wilson	M.E.-Feb.'49	Bethlehem
Stroman, George Levin, Jr.	Met.E.-Feb.'49	Philadelphia
Strothman, John Wesley	Ch.E.-June'51	Rumson, N.J.
Sturiale, Philip John	E.E.-June'52	Brooklyn, N.Y.
Styer, Donald McCavery	Bus.-June'52	Phoenixville
Sublett, George Robert	Met.E.-June'51	Huntsville, Ala.
Suereth, Dale Nagle	Bus.-Feb.'50	York
Suereth, Edward Clifford, Jr.	Bus.-Feb.'49	York
Sule, Alader	Arts-June'49	Palmerton
Sullivan, James Aloysius, Jr.	E.M.-June'51	Jersey City, N.J.
Summers, Thomas Gillmer	Bus.-June'49	Warren, Ohio
Surplus, Carlton Wrightson	E.E.-June'52	Gouldsboro
Swanberg, Sixten Curt	I.E.-Feb.'50	Summit, N.J.
Swanson, Robert Norman	Bus.-June'50	East Williston, N.Y.
Swantek, John Edward	Bus.-Feb.'51	Glenolden
Swartz, John Frederick	Met.E.-June'52	Pittsburgh
Swartzwelder, George Mark, Jr.	Ch.E.-June'50	Reading
Swayne, Robert Henry	E.E.-June'49	Upper Darby
Swaysland, John Edward, Jr.	Bus.-Feb.'51	Plainfield, N.J.
Sweeney, John Edward, Jr.	C.E.-Feb.'52	Woodbury, N.J.
Sweigard, Charles Bertram	Arts-June'52	Bethlehem
Sweinberg, Leroy Albert	M.E.-June'49	Wilkes-Barre
Swenson, Charles Edward	Bus.-June'50	Grosse Pointe, Mich.
Swick, Robert James	E.E.-June'50	Phillipsburg, N.J.
Sword, Stephen Taylor	Arts-June'51	White Plains, N.Y
Symanovich, Michael Martin	Met.E.-June'52	Palmerton
Szakmeister, Robert John	Met.E.-June'52	Bethlehem
Szvetecz, Charles, Jr.	I.E.-Feb.'49	Bethlehem
Szvetecz, Ernest	C.E.-June'52	Bethlehem
Szymakowski, Stanley Chester	Arts-June'49	Bethlehem

Tabor, Clarence John, Jr.	E.E.-June'50	Ashland
Tait, William Walker III	Arts-June'52	Walden, N.Y.

Tamanini, Elmer Benjamin	I.E.-June'52	Mount Carmel
Tapper, Bruce Yale	Arts-June'50	Paterson, N.J.
Tatge, Robert Bruce	E.E.-Feb.'50	West Englewood, N.J.
Taylor, David Clair	Chem.-June'52	Clearfield
Taylor, Edmund Pendleton	M.E.-June'49	Wheeling, W.Va.
Taylor, Harold	E.E.-June'49	David City, Nebr.
Taylor, Lloyd Chamberlain, Jr.	Arts-June'49	Richmond, Va.
Taylor, Robert Frank	Arts-June'52	West Orange, N.J.
Taylor, Robert Lawrence	Arts-June'51	New York, N.Y.
Taylor, Robert Norman	Arts-June'51	Hellertown
Taylor, Thomas Michael, Jr.	Bus.-June'51	Rutherford, N.J.
Teden, Herbert Eugene, Jr.	Bus.-Feb.'49	Chatham, N.J.
Temoshok, Stephen Henry	Arts-June'50	Northampton
Tenenholz, Arthur Mitchell	E.P.-Feb.'49	Frackville
TenEyck, Richard Conger	Bus.-June'49	Elizabeth, N.J.
Tepper, John Charles	I.E.-June'52	Bergenfield, N.J.
Terry, Robert Joseph	Bus.-June'52	Bloomfield, N.J.
Theile, Kenneth William	Ch.E.-Feb.'49	Tenafly, N.J.
Thiell, Edward Paulding	C.E.-Feb.'50	White Plains, N.Y.
Thomas, David Robert	E.P.-June'51	Bethlehem
Thomas, Garfield George, Jr.	Bus.-June'49	Carbondale
Thomas, George Franklin	M.E.-Feb.'50	Harrisburg
Thomas, John Lemuel	Arts-Feb.'51	Lock Haven
Thompson, Charles Douglas	E.M.-June'51	White Plains, N.Y.
Thompson, David Clark	Bus.-June'51	Rockville Centre, N.Y.
Thompson, Peter	Bus.-Feb.'51	Staten Island, N.Y.
Thomson, Kenneth	M.E.-June'52	Chester
Thomson, Millard Robert	M.E.-June'49	Walton, N.Y.
Thomson, Murray Beaumont	Met.E.-June'51	Niagara Falls, N.Y.
Thomson, Robert Jordan	Arts-June'49	Drexel Hill
Thomson, William Edward	Bus.-June'49	Summit, N.J.
Thorn, Leemond John	Ch.E.-June'49	Upper Darby
Thorpe, Richard Gardiner	Bus.-Feb.'49	New Haven, Conn.
Thorsell, Richard Siegfried	Arts-June'52	Dover, N.J.
Tice, Wilbur Addison	Bus.-June'49	Yonkers, N.Y.
Tichenor, William Hillier	I.E.-June'49	Matawan, N.J.
Tiedemann, Walter John	Bus.-Feb.'51	Richmond Hill, N.Y.
Tiffany, Phillip Miller	I.E.-June'49	Kingston
Timmins, John Francis	M.E.-June'50	Bethlehem
Titzck, Clemens III	Bus.-June'50	Haddon Heights, N.J.
Tomaselli, Julius Louis Francis	Arts-June'50	Cliffside Park, N.J.
Tomasic, John Matthew	E.E.-June'50	Bethlehem
Tomkovich, John Michael	Chem.-Feb.'50	South River, N.J.
Tooher, James Marshall	Bus.-June'52	Schenectady, N.Y.
Toolin, Bertram James	Met.E.-June'52	Elkins Park
Torpey, Stephen Edmund	Arts-Feb.'49	Bethlehem
Toven, Joseph Richard	Arts-June'52	Mount Vernon, N.Y.
Towne, Ralph Louis	M.E.-June'52	Toledo, Ohio
Tracy, William Irwin	Bus.-June'50	South Orange, N.J.
Traise, John Earle	M.E.-June'49	Islington, Ontario, Canada
Treichler, John Howard	Ch.E.-Feb.'49	Elizabethtown
Trethaway, William III	I.E.-June'51	East Orange, N.J.
Tretter, Albert Joseph	I.E.-June'50	Allentown
Trexler, John Peter	Arts-Feb.'50	Allentown

Trily, Martin Edward	C.E.-June'50	Bethlehem
Tripp, Isaac III	I.E.-June'51	Aurora, Ohio
Tripp, William Eddy	E.E.-Feb.'50	Camp Hill
Tripucka, Paul	E.M.-June'52	Maywood, N.J.
Trost, Douglas Charles	C.E.-June'51	Staten Island, N.Y.
Trost, George Paul	Met.E.-June'50	Williamsport
Trost, William Joseph	C.E.-June'52	Philadelphia
Trout, Jack Roland	Chem.-June'49	New Freedom
Trout, Walter Stevens	Ch.E.-June'51	Cape May, N.J.
Troy, Howard Charles	Bus.-June'52	Elmira, N.Y.
Trucksess, Andrew William	I.E.-June'51	Haddonfield, N.J.
Trumpoldt, Herbert William	Bus.-June'50	Huntingdon Valley
Tschopp, Elwood Richard	M.E.-June'52	Allentown
Tucker, Jack Ernest	Bus.-Feb.'51	Latrobe
Tucker, Jesse Samuel	Arts-June'52	Northampton
Tuhy, Philip Radmir	E.P.-June'52	Wilkes-Barre
Turn, Kenneth Edwin	Arts-June'49	West Hartford, Conn.
Turnbull, David Stone	I.E.-June'49	North Branch, N.J.
Turnbull, Maynard Henry, Jr.	M.E.-Feb.'50	York
Turnbull, Robert Peterson	E.E.-June'49	Ardmore
Turner, Elton Wilbur	M.E.-June'49	Norwich, N.Y.
Turner, Thomas Gerald	M.E.-June'52	Easton

Ullmann, Thomas Mifflin	Arts-June'49	Bethlehem
Ulrope, Leonard Eagles, Jr.	Bus.-June'50	Short Hills, N.J.
Underhill, Jerome Stephenson, Jr.	C.E.-June'52	Trenton, N.J.
Unver, John Frederick, Jr.	Bus.-Feb.'51	Montvale, N.J.
Updegrave, Walter Charles	M.E.-June'51	Coopersburg
Ursic, Henry Simon	G.C.D.	Easton
Utz, Robert Leon	E.E.-June'51	Hanover

Valeriano, Joseph Albert	Bus.-June'51	Utica, N.Y.
Valeur-Jensen, Sven	M.E.-June'51	Copenhagen, Denmark
Valleroy, Eugene Anthony	I.E.-June'51	St. Louis, Mo.
Valovage, Walter Daniel	Met.E.-June'52	Bethlehem
VanAllen, Harry Roland	Bus.-Feb.'49	Queens Village, N.Y.
Van DeBoe, Robert Burr	I.E.-June'50	Drexel Hill
Vanderbeak, Augustus	Ch.E.-June'52	Somerville, N.J.
Vanderryn, Jack Simon	Arts-June'51	Kew Gardens, N.Y.
VanDine, James LaRue	E.E.-Feb.'51	Hughesville
VanDuyne, Leonard Ewing	E.E.-June'50	East Orange, N.J.
VanDyke, Bruce Russell	Bus.-June'52	Pittsburgh
VanKueren, John William	Bus.-Feb.'50	Bethlehem
VanLoan, William Franz, Jr.	C.E.-June'52	Valley Stream, N.Y.
Vannerson, Robert Aylmer	Arts-Feb.'49	Wilmington, Del.
VanNess, John Hasbrouck	E.E.-June'51	Glen Rock, N.J.
VanNest, Arthur Claude	I.E.-Feb.'50	Parkersburg, W.Va.
VanTilburg, Robert Wyant	Ch.E.-June'51	North Plainfield, N.J.
VanTuyl, William Harold	Bus.-June'52	Wantagh, N.Y.
VanWagenen, Donald	Ch.E.-June'49	West Hurlay, N.Y.
Varker, Frederick Dreisbach	Arts-June'52	Nanticoke
Varley, Herbert Paul, Jr.	Arts-June'52	Ridgewood, N.J.
Vasiliadis, Peter Jordan	M.E.-June'49	Bethlehem
Vath, Daniel Edwin	M.E.-June'51	Reading
Vaxmonsky, Joseph John	Ch.E.-Feb.'51	Pittston

Velie, Carl Powers	Bus.-Feb.'50	Painted Post, N.Y.
VenVertloh, Thomas	Arts-June'51	Rochester, N.Y.
Vetter, Albert Steven	Bus.-Feb.'50	Califon, N.J.
Vetter, Earl William	G.C.D.	Bristol
Vickers, John William	M.E.-Feb.'51	Cambridge, N.Y.
Vidal, Louis Melchior	Arts-June'52	New York, N.Y.
Viehmann, Norman John	M.E.-June'50	Manhasset, N.Y.
Vieira, Raymond Joseph	Bus.-June'49	Brooklyn, N.Y.
Villa, Peter Steve	M.E.-June'51	Lebanon
Virbal, Paul Anthony	E.E.-June'49	Duryea
Virden, Emerson Hart, Jr.	Ch.E.-June'49	Ardsley, N.Y.
Vogelsong, James Howard	E.E.-June'49	York
Vogt, George Louis	Bus.-June'50	Reading
Vogt, George Robert	Bus.-June'49	Newark, N.J.
VonBlohn, Henry Carl	Met.E.-Feb.'49	Danville
VonDreusche, Charles Frederick	Ch.E.-Feb.'52	Brooklyn, N.Y.
Voorhees, Franklin Charleston	Bus.-June'50	Easton
Voros, Charles Franklin	Bus.-Feb.'50	Bethlehem
Vosseller, George Vernon	Ch.E.-June'50	Buffalo, N.Y.
Vroome, Elwood Pearson	I.E.-June'51	New York, N.Y.
Vuksta, Charles Eric	Met.E.-June'51	Hellertown
Wagenseil, Robert Arthur	M.E.-June'49	Rockville Centre, N.Y.
Wager, Gilbert Carl	E.E.-June'49	Bronx, N.Y.
Wagner, Lyle Edward	Ch.E.-Feb.'50	Schuylkill Haven
Wagner, Robert Augustus, Jr.	M.E.-June'52	Harrisburg
Wagonhurst, Robert H.	Bus.-Feb.'49	Bechtelsville
Wain, Donald John	Ch.E.,-June'50	Trenton, N.J.
Wait, John Richard	Bus.-Feb.'50	Detroit, Mich.
Walbrecker, Richard Arlen	C.E.-June'52	Wyomissing
Walden, Robert Louis	Bus.-Feb.'49	New York, N.Y.
Walek, Walter John	Met.E.-June'51	East Hartford, Conn.
Walker, Albert	Ch.E.-June'51	Audubon, N.J.
Walker, Clifford Dewey, Jr.	Met.E.-June'52	Springfield, N.J.
Walker, John Weldon	Arts-June'52	Newark, N.J.
Walker, Richard Stanley	Ch.E.-Feb.'50	Fairfield, Conn.
Walker, Roy Miller	M.E.-Feb.'49	Philadelphia
Walker, Thomas Edward	E.E.-June'52	Upper Darby
Wall, William Edward	M.E.-Feb.'51	Cristobal, Canal Zone
Wallace, Donald Alvin	Arts-June'49	Bethlehem
Wallace, Edwin Andrew	E.E.-June'50	Bethlehem
Wallace, James Denithorne	Bus.-June'50	South Orange, N.J.
Wallick, Robert Daniel	Bus.-June'49	Washington, D.C.
Wallwork, Gealy Weston	E.M.-June'52	Kittanning
Walmer, Marlin Soulliard	Ch.E.-June'52	Lebanon
Walsh, William Joseph	M.E.-June'50	Allentown
Walter, Dolph Powell	Bus.-Feb.'51	Ridgewood, N.J.
Walter, Paul Charles	Arts-June'49	Bethlehem
Walters, Robert	Arts-Feb.'52	Bethlehem
Walters, Russell John	C.E.-Feb.'50	Tamaqua
Walters, William Harvey	Ch.E.-June'52	Wilkes-Barre
Walton, Howard LeRoy	C.E.-June'49	Woodlynne, N.J.
Wane, Malcolm Trafford	E.M.-June'50	West Pittston
Ward, Arne Dalrymple	Arts-June'52	Dover, N.J.
Ward, Edward William, Jr.	Bus.-June'51	Short Hills, N.J.

Ward, Frank Joseph	Bus.-Feb.'49	Richmond Hill, N.Y.
Ward, John Albert	Bus.-June'51	Westfield, N.J.
Wardell, Edward John	C.E.-Feb.'52	Trenton, N.J.
Wardell, Westen Burnet, Jr.	Arts-June'51	Buffalo, N.Y.
Wareck, Donald Joel	Arts-June'49	Lawrence, N.Y.
Warg, Thurlow Robert	Bus.-June'50	Bethlehem
Warren, Walter Wallace	Bus.-June'50	Bethlehem
Wartman, Robert Clayton	Bus.-Feb.'49	Bethlehem
Wash, James Paul	Bus.-June'52	Bethlehem
Washburn, Thomas Cox	E.E.-June'52	Roselle Park, N.J.
Washer, Richard Bennington	E.E.-June'52	Rockville Centre, N.Y.
Wasson, William Harold, Jr.	Ch.E.-June'49	Bethlehem
Watson, Edwin Charles	I.E.-June'50	Ilion, N.Y.
Watson, James Angus III	Arts-Feb.'50	Bethesda, Md.
Watson, Robert Clement, Jr.	Arts-Feb.'50	Silver Spring, Md.
Watson, Stanley Philip	Bus.-Feb.'49	Allentown
Watson, Thomas Joseph	Ch.E.-June'49	Scranton
Watter, John Frederick	E.E.-June'50	Essex Fells, N.J.
Watts, Richard Mitchell	M.E.-June'50	Dover, N.J.
Wavrek, Charles Dewey, Jr.	Bus.-Feb.'49	Fullerton
Way, John William	Chem.-Feb.'50	Coatsville
Way, Townsend Lawrence, Jr.	Bus.-Feb.'49	Havertown
Weaber, John Franklin	Met.E.-Feb.'49	Lebanon
Weaver, John Myron	Bus.-June'51	Rye, N.Y.
Webb, Stuart Bates	Bus.-June'50	Wayne
Weber, Charles Anthony	Arts-Feb.'50	Hellertown
Weber, Donald Kenneth	Bus.-Feb.'49	Shillington
Weber, Jim Deeds	E.E.-June'52	Upper Darby
Weeks, Daniel	E.E.-June'52	Brooklyn, N.Y.
Weibel, Richard John	Arts-June'51	Allentown
Weidman, Richard	Ch.E.-June'50	New Holland
Weil, Harry Joseph	Met.E.-June'51	Bethlehem
Weinberg, William Stuart	Bus.-Feb.'51	Mount Vernon, N.Y.
Weinrott, Joel Henry	Ch.E.-June'50	Philadelphia
Weintraub, Thomas Elwood	I.E.-June'49	Elkins Park
Weisel, John Mills	I.E.-Feb.'49	New York, N.Y.
Weisel, Merrill Godshall	Bus.-June'50	Sellersville
Weiss, Herbert William	E.E.-June'52	Johnstown
Weiss, Roger Herbert	Bus.-June'52	Rockville Centre, N.Y.
Weisser, Herbert	E.E.-June'52	Hasbrouck Heights, N.J.
Welanetz, Peter Paul	C.E.-Feb.'49	Bethlehem
Wellen, Norman Millard	Bus.-June'52	Newark, N.J.
Welliver, William Emory	Bus.-June'49	Trenton, N.J.
Wellner, Robert Harry	Arts-June'52	Brooklyn, N.Y.
Wells, Harold Neilson	Ch.E.-June'51	Millville, N.J.
Weltz, Robert Earl	G.C.D.	Swarthmore
Wenberg, Jordan William	Arts-June'50	Media
Wenner, Lee Bruce, Jr.	M.E.-Feb.'51	Bethlehem
Wentzel, Eugene Noecker	Ch.E.-June'49	Stony Creek Mills
Werley, Donald Robert	C.E.-Feb.'49	Egypt
Werst, Mervin Claude	E.P.-June'51	Perkasie
Werst, Weston Homer	I.E.-Feb.'50	Bethlehem
Wertman, Richard Carlton	E.P.-June'51	Allentown
Wertz, Marcus Emmons, Jr.	I.E.-June'50	Belleville, N.J.
Wesolowski, Chester	M.E.-Feb.'49	Providence, R.I.

West, Frank Edward	Arts-June'50	Scranton
Westland, Clayton Coppins	Bus.-June'50	Scarsdale, N.Y
Weston, John Michael	C.E.-June'50	Allentown
Wetzel, Daniel Lawrence	M.E.-Feb.'50	Bethlehem
Wetzel, Jack David	M.E.-Feb.'49	Green Lane
Wetzel, Richard Carl	I.E.-June'51	Allentown
Wharry, Robert Arthur	Bus.-June'50	Larchmont, N.Y.
Whedon, Charles Irwin	M.E.-June'52	Roselle, N.J.
Wheeler, Robert George	E.P.-June'50	Allentown
Wheeler, Robert Hayward	Bus.-June'50	Stratford, Conn.
Whetham, Paul Elborn	Chem.-Feb.'52	Hawthorne, N.J.
Whissen, Henry Albert	Arts-June'49	Washington, D.C.
Whitaker, Richard Allen	E.E.-June'50	Coopersburg
White, Charles McCrea, Jr.	Bus.-June'51	Camp Hill
White, Edward Williams	Arts-June'49	New York, N.Y.
White, Quentin Marburg	M.E.-Feb.'50	Parkersburg, W.Va.
White, Thomas Gerard	Arts-Feb.'50	Butztown
Whiteman, Alfred Eugene Burk	M.E.-June'52	Wyncote
Whittaker, Don Fisk	Arts-June'50	New Providence, N.J.
Whittaker, Douglas Harold	Bus.-June'51	Shelton, Conn.
Whitten, Leslie Hunter, Jr.	Arts-June'50	Washington, D.C.
Wibiralske, Fred	E.E.-June'50	West Orange, N.J.
Widmer, Robert Harry	Bus.-Feb.'49	Scranton
Wieder, Robert Edward	Bus.-June'49	Reading
Wiegand, August Frederick	I.E.-June'49	Fords, N.J.
Wiegner, Andrew Newton, Jr.	M.E.-Feb.'51	Bethlehem
Wien, Raymond Edgar	Met.E.-June'50	Tamaqua
Wiersma, Volkert	M.E.-June'49	East Orange, N.J.
Wilbern, Wilmer Linwood	I.E.-June'52	Oyster Point, Va.
Wilde, James Arthur, Jr.	I.E.-Feb.'49	Hohokus, N.J.
Wiley, David Benjamin	Bus.-June'52	Pittsburgh
Wilford, George Anthony	E.M.-June'52	Tamaqua
Wilhide, Robert Hagedorn	Bus.-June'51	Frederick, Md.
Wilkinson, Charles Alexander	Arts-June'49	Bethlehem
Wilkinson, George Frederick, Jr.	E.E.-June'50	Bethlehem
Wilkinson, Samuel Barton	C.E.-June'51	Mount Carmel
Wilks, William Lee	Bus.-June'51	Manhasset, N.Y.
Willard, Gates	Arts-June'51	Bethlehem
Willauer, David Edgar	Ch.E.-June'51	Norristown
Williams, Charles Henry Rice	Bus.-June'50	Hazleton
Williams, Daniel Emory, Jr.	Ch.E.-June'49	Marathon, N.Y.
Williams, David Fulton	E.P.-Feb.'51	Sault Ste. Marie, Ontario
Williams, David Gordon	E.E.-June'49	Brooklyn, N.Y.
Williams, David Martin	Arts-Feb.'50	Plainfield, N.J.
Williams, Donald Frederick	Arts-June'49	Allentown
Williams, Douglas Hocker	Arts-June'50	Newtown
Williams, Elmer Hugh, Jr.	Bus.-June'49	Pelham, N.Y.
Williams, Eugene Griffin	Arts-June'50	Media
Williams, Harry Hancock, Jr.	Arts-June'49	Allentown, N.J.
Williams, Homer David, Jr.	E.E.-June'51	Easton, Md.
Williams, John Edward	Bus.-June'50	Bethlehem
Williams, Joseph Adolph	Ch.E.-June'51	Allentown
Williams, Robert John	E.M.-June'52	Maplewood, N.J.
Williamson, Rae Robert	Bus.-June'50	Bethlehem

Williamson, Ward	Arts-June'51	Ithan
Wilson, Albert Henry III	Met.E.-June'49	Pittsburgh
Wilson, James Korah	M.E.-Feb.'49	Oreland
Wilson, James McClelland	Arts-Feb.'51	Lansdowne
Wilson, James Ritson, Jr.	Arts-June'52	Clarks Green
Wilson, John Edgar Miller, Jr.	E.M.-June'51	Pittsburgh
Wilson, Kenneth Morley	Arts-Feb.'49	Bethlehem
Wilson, Richard Leon	Bus.-June'52	Morristown, N.J.
Wilson, William Elmer	Ch.E.-June'51	Gloversville, N.Y.
Wilson, William Kenneth	Bus.-Feb.'50	Glen Ridge, N.J.
Wiltsie, David Sumner	Arts-June'52	Hazleton
Windish, Joseph Ronald	Bus.-Feb.'50	Allentown
Winner, Clifford, Jr.	Bus.-June'51	Hatboro
Winner, George Woodward	Bus.-June'51	Hatboro
Wirth, Charles	Ch.E.-June'51	Bethlehem
Wisotzkey, John Utz, Jr.	Bus.-June'51	York
Wissman, Harold John	I.E.-June'52	Teaneck, N.J.
Witczak, Leo Raymond	E.E.-Feb.'50	Bethlehem
Wittemann, Ross Gardner	M.E.-June'51	Maplewood, N.J.
Wittenberg, Lloyd Armstrong	Bus.-June'51	Westwood, N.J.
Wixson, Roger Arlen	Bus.-June'51	Oneida, N.Y.
Wolcott, Merlyn Frederick	M.E.-June'51	Pottstown
Wolf, John Carl	E.E.-June'51	Hawthorne, N.J.
Wolf, Ray Gilbert	I.E.-Feb.'52	Red Bank, N.J.
Wolf, Warren Stewart	Ch.E.-June'51	Bronxville, N.Y.
Wolfe, Lewis Harvey	Met.E.-Feb.'49	Nazareth
Wong, Kit Ying	Met.E.-June'50	Oranjestad, Aruba
Wood, Duncan MacKenzie, Jr.	C.E.-Feb.'50	New York, N.Y.
Wood, Richard Francis, Jr.	E.E.-June'49	Larchmont, N.Y.
Wood, Robert Charles	Arts-June'51	Cleveland, Ohio
Wood, William Guion	E.M.-June'51	Bethlehem
Woodbury, Charles Fairfield, Jr.	M.E.-June'50	Westfield, N.J.
Woodring, Ralph Walton, Jr.	Bus.-Feb.'51	Bethlehem
Woolman, Richard Hulme	M.E.-June'51	New Hope
Wright, Donald Stuart	M.E.-June'52	Bethlehem
Wright, John Marshall	E.E.-June'52	Elizabeth, N.J.
Wright, Robert Trevor	M.E.-June'49	Philadelphia
Wulpi, Donald James	Met.E.-June'49	Scranton
Wynne, John Harvey	Met.E.-June'49	Burlington, N.J.
Yale, David Rodney	C.E.-June'51	Northampton
Yamarick, John William	Ch.E.-June'51	Union, N.J.
Yannone, Michael Edward	Arts-June'51	Easton
Yaple, Fred Orren, Jr.	Met.E.-Feb.'49	Trenton, N.J.
Yard, John Schuyler	Ch.E.-June'52	Hartford, Conn.
Yates, Robert Wilson	Arts-June'50	New York, N.Y.
Yatsko, Michael Andrew	M.E.-June'50	New York, N.Y.
Yocum, George Mack II	Bus.-Feb.'49	Lansdale
Yorgey, Richard Sheldon	I.E.-June'49	Birdsboro
Yost, Alan Edward, Jr.	Arts-Feb.'50	Telford
Yost, Charles William	Arts-June'51	Stewartstown
Youmans, Wilmer Leslie	E.P.-June'52	Yonkers, N.Y.
Young, Charles William	E.M.-Feb.'50	Harrisburg
Young, Donald James	Ch.E.-June'51	Scarsdale, N.Y.
Young, George Boardman	Arts-June'52	East Lansdowne

Young, Irwin Wallace	I.E.-Feb.'50	Rockville Centre, N.Y.
Young, John Wallace	Ch.E.-June'50	Waverly, N.Y.
Young, Richard Flint	Arts-June'51	Bergenfield, N.J.
Young, Ronald Johnson	Bus.-Feb.'51	Packanack Lake, N.J.
Young, Roy Beverson, Jr.	M.E.-June'51	Morton
Young, Russell Shipman	Bus.-June'51	Montclair, N.J.
Young, Thomas Edwin	Ch.E.-Feb.'49	Rothsville
Youry, Robert Simmons	Bus.-June'52	Maplewood, N.J.
Yutz, Richard William	E.E.-June'52	Allentown
Zack, Raymond Anthony	I.E.-June'49	Pittston
Zambone, Albert Stephen	Ch.E.-June'52	Vineland, N.J.
Zamos, James Adam	Arts-June'52	Newton, N.J.
Zapf, John Louis	M.E.-Feb.'51	Toledo, Ohio
Zehner, Walter Randall	I.E.-June'52	Coopersburg
Zeidler, Roland Carl	Bus.-June'49	Rutherford, N.J.
Zeigler, Basil Morgan	G.C.D.	Bethlehem
Zern, Paul Edward	Ch.E.-June'49	Lehighton
Ziegler, John Frederick	Bus.-June'50	Nazareth
Zillessen, Paul Ehrlich	Arts-June'52	Pen Argyl
Zimmerer, Karl Francis	C.E.-June'49	Nutley, N.J.
Zingales, Thomas Joseph	Arts-June'51	Cranford, N.J.
Zipf, Carl Henry, Jr.	Met.E.-Feb.'52	Bethlehem
Zito, Vincent Aurelio	M.E.-June'52	Hartford, Conn.
Zortman, Harry Edward, Jr.	Ch.E.-June'49	York
Zucker, Alan Jay	Bus.-June'49	Maplewood, N.J.
Zuckerman, Herbert Lawrence	Bus.-June'49	Maplewood, N.J.
Zug, Charles Keller III	Arts-June'52	Bethlehem
Zweier, Bruce Vernon	Met.E.-June'52	Kingston
Zwickl, Richard Donald	I.E.-June'52	Allentown

ADULT EDUCATION

*Fall and Spring Semesters 1948-1949

Alderfer, Ruth Stover B.S. in Ed., Goshen.	Blooming Glen
Alfano, Charles Samuel	Wyoming
Allen, Virginia Lee	Bethlehem
Allspaw, Eleanor Louise Lewis B.S. in Ed., Pennsylvania State Teachers College (West Chester).	Easton
Altemose, Vincent Ortheller, Sr.	Windgap
Anderson, Ella Dorothea	Easton
Andreas, Thelma B.S., Columbia; M.A., New York University.	Palmerton
Anthony, John Paul B.S. in I.E., Lehigh.	Allentown
Bacon, Wilma Jean B.S. in Ed., Pennsylvania State Teachers College (Indiana).	Allentown

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*The Adult Education Program for the Summer of 1948 was combined with the Summer Session. Students who registered only for the non-credit course on the Far East offered in the Spring Semester are not listed.

Barres, Marjorie Jane B.A., Oberlin.	Bethlehem
Barres, Oliver, Jr. B.A., Yale.	Bethlehem
Barthold, Harold Joseph A.B., Muhlenberg; M.A., Lehigh.	Bethlehem
Bastian, William Russel B.S., Pennsylvania State.	Allentown
Bechdolt, William Robert B.S. in Met.E., Lehigh.	Palmerton
Beck, Lewis White A.B., Emory; M.A., Ph.D., Duke.	Bethlehem
Behler, Wilmer George	Bethlehem
Belshaw, Mary	Bethlehem
Berlau, Charles Jacob B.S. in M.E., Lafayette.	Easton
Best, Anna Maria	Allentown
Blair, Anne Peterson	Claredon
Bleiler, Ernest Michael B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Fogelsville
Bomberger, Harry Rudy A.B., Swarthmore.	Palmerton
Bookholt, John Henry A.B., Dickinson.	Lehighton
Boris, Walter	Farrell
Bowden, Edmund Warren, Jr. B.S. in I.E., Lehigh.	Bethlehem
Bowers, Elizabeth Kuntz B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Walnutport
Bream, Elizabeth Grovestein A.B., Radcliffe; A.M., Harvard.	Bethlehem
Broad, Frank Weaver B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Bethlehem
Brown, Robert Emmett	Bethlehem
Brubaker, David Gordon B.S., Hastings; M.A., Nebraska; Ph.D., Yale.	Palmerton
Buc, Ruth Ritchie B.S., South Carolina.	Easton
Burleigh, Robert Parker A.B., Syracuse.	Allentown
Burns, Valirie Zasinas	Easton
Carl, Virginia Alice	Bethlehem
Carter, Barbara Barbé B.A., Pennsylvania State.	Allentown
Cassler, Robert William, Jr. B.A., Lehigh.	Hazleton
Cericola, Nicholas Ralph B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Easton

Chelly, Irvan	Nazareth
Chubbuck, Dorothy B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Bethlehem
Clark, Ronald Dunbar B.S. in Agr. Ed., Pennsylvania State.	Quakertown
Cohen, Jane M.	Bethlehem
Combellick, Thomas Avery B.S., Hampden-Sydney.	Allentown
Conant, Evelyn Frances A.B., Mt. Holyoke; M.A., Columbia.	Phillipsburg, N.J.
Cope, Margaret Imogene B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Palmerton
Criswell, Cloyd Mann B.S. in Ed., Pennsylvania State Teachers College (Millersville), M.A., New York University.	Bethlehem
DeHaven, Carl Henry	Schnecksville
Dent, Frederick Grant B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg).	Allentown
Derr, Margaret Fellenberg B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Emmaus
Derrico, Jacob Placido A.B., Moravian.	Bethlehem
deSchweinitz, Dorothy Bradshaw	Bethlehem
Dickie, Corinne Conant A.B., Moravian College for Women.	Bethlehem
Dimmick, Ethel Olga B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Easton
Dimmick, Martha Elizabeth B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Easton
Ditterline, Elizabeth Virginia	Bethlehem
Dodson, Evelyn Mott	Bethlehem
Donecker, Evelyn Agnes	Easton
Downs, Helen Sfredda	Bethlehem
Duckworth, Bertha	Finesville, N.J.
Dunn, Harry Richard B.S. in Bus. Adm., Lehigh.	Bethlehem
Durham, Fred Stranahan, Jr. A.B., Princeton.	Allentown
Dwyer, Irene	Palmerton
Edwards, Phyllis Mildred B.S., Pennsylvania State; M.A., George Washington.	Kutztown
Eife, Edna B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Canadensis
Enright, Teresa Bernadine	Bethlehem
Evans, William Thomas A.B., Muhlenberg.	Allentown
Faduska, Charles B.S. in Ed., Pennsylvania State Teachers College (Mansfield).	Bear Creek

Fangboner, Ada	Easton
Fegley, Ruth A.B., Pennsylvania.	Bethlehem
Finkle, Blanche Hopkins	Bethlehem
Fisher, Margaret Ruth B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Bethlehem
Fitzgibbons, Lenora Petty	Bethlehem
Fortino, Patty Salvatore	Easton
Foy, Lewis Wilson	Bethlehem
Frankenfield, Dorothy Keown	Allentown
Fritz, Bernard John A.B., Moravian.	Bethlehem
Fuhr, John Ph.B., Muhlenberg; M.B.A., Pennsylvania.	Bethlehem
Fuller, Martin Luther B.S., Pennsylvania.	Palmerton
Galt, Frances Thomas A.B., Vassar.	Easton
Gilbert, Carl Benjamin	Allentown
Glace, William Oregon	Catasauqua
Gledhill, Robert Bradford B.S. in Ed., Pennsylvania State Teachers College (Kutztown); M.A., Lehigh.	Allentown
Good, Gen Bennett	Bethlehem
Goodman, Sophia	Bethlehem
Gordon, Betty Louise	Bethlehem
Greiner, Henry Sandt B.S. in Ch.E., Lehigh.	Bethlehem
Gross, Charles Franklin, Jr. B.S. in Ed., Pennsylvania State Teachers College (West Chester).	Bethlehem
Gross, Geraldine Moyer B.A. in Ed., Goshen.	Doylestown
Hammer, Barbara Jeanette B.S., Queens (New York).	Bethlehem
Hammer, Theodore Emanuel B.S. in E.E., Bucknell; B.D., Lutheran Theological Seminary at Philadelphia.	Bethlehem
Hanfmann, Alexander Maxim	Allentown
Hankee, Evan John B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Northampton
Harmany, Charles Calvin B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg).	Allentown
Hartzell, Leah Elizabeth	Easton
Heckel, Benjamin Harrison	Morristown, N.J.
Heidecker, Thomas Robert	Bethlehem
Heins, Ann Katherine A.B., Russell Sage.	Glen Falls, N.Y.

Heist, William Frederick B.S. in M.E., Georgia School of Technology.	Eustis, Fla.
Held, Isabel Rachel B.S. in Ed., Muhlenberg.	Fullerton
Held, Jean Ackley B.S. in Ed., Temple.	Allentown
Helm, Helen Conrad.	Easton
Hensinger, Claude Elias B.S. in M.E., Lehigh.	Palmerton
Herb, John Charles	Easton
Hess, Raymond K. S.	Bethlehem
Higgins, John Joseph B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Pen Argyl
Hinkle, James Oliver B.S. in M.E., Pennsylvania State.	Emmaus
Hittinger, William Charles B.S. in Met.E., Lehigh.	Bethlehem
Hochheiser, Morton B.S. in Ed., Temple.	Riverhead, N.Y.
Hollywood, Cletus Joseph B.S., St. Bonaventure.	Palmerton
Horneck, Jean Ruth	Bethlehem
Hosler, Betty Jane B.S. in Ed., Pennsylvania State Teachers College (Indiana).	Allentown
Hufnagel, Eleanor May B.S. in Ed., Pennsylvania State Teachers College (West Chester).	Easton
Huver, Jean Louise B.S., Susquehanna.	Allentown
Jackson, Lois Muriel Baker A.B., Syracuse.	Bethlehem
James, Malcolm, Sr. B.S., Bucknell.	Easton
Janoscrat, Elizabeth Ann B.S. in Ed., Pennsylvania State Teachers College (Indiana).	Allentown
Jellison, Elizabeth Emma B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Emmaus
Jenkins, Betty Jane B.S., Cedar Crest.	Allentown
Jenkins, Lois Chichester	Hellertown
Jensen, Julie Ellen	Bethlehem
Johnson, Lester William B.S. in M.E., Lafayette.	Phillipsburg
Johnson, Robert William B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Johnson, William Birely B.S. in Econ., Franklin and Marshall.	Allentown
Jones, Ifor Mus.D., Rutgers; F.R.A.M.	Bethlehem
Jones, Lilian Knowles	Bethlehem

Karron, George Arthur B.E.E., New York University.	Allentown
Keelan, John Gerard B.S. in E.E., Illinois.	Allentown
Kelchner, Harley Ebner B.S. in M.E., Lehigh.	Bethlehem
Kelly, Dale B.S. in Eng. Phys., Lehigh; M.A., Columbia.	Bethlehem
Kelly, Ruth Hemmerly A.B., Moravian; B.L.S., Columbia; M.A., Lehigh.	Bethlehem
Kichline, Lois Pearson B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Kilpatrick, Raymond Guy B.S., Louisianna State.	Bethlehem
Kirby, Carolyn Junod B.A., Ursinus.	Allentown
Klein, Esther	Allentown
Klein, Richard Leslie	Allentown
Kleinschmidt, Eleanor Loos B.A., Pennsylvania.	Bethlehem
Kleppinger, Emma May A.B., Houghton.	Northampton
Kocher, Richard Franklin	Palmerton
Kocsis, Margaret Henry	Bethlehem
Koons, Dorothy W.	Bethlehem
Koven, Marie Louise	Riegelsville
Krauss, Mildred Charlotte B.S. in Ed., Pennsylvania State Teachers College (West Chester); M.A., Lehigh.	Centre Valley
Kurtz, Claude Jennings B.S. in Ch.E., M.S., Lehigh.	Bethlehem
Kyner, Julia Carline	Zionsville
Latteman, William George	Phillipsburg, N.J.
Lay, Elsie Ada	Sellersville
Leauber, Ruth Shirley	Easton
Leisy, Reuben Warren B.S., Colorado; M.S., Michigan State.	Palmerton
Lengel, Kathryn May	Neffs
Lenky, Zoltan Gordon	Bethlehem
Lewis, Andrew William B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg); M.A., Columbia.	Cresco
Lichty, Horace James A.B., Lafayette.	Easton
Lilly, Howard Edward	Allentown
Lombardi, Wilson John	Allentown
Lukens, Elizabeth Jane B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown

Mahood, Eleanor Wright	Coopersburg
Major, Elma L. B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg); M.S., Michigan.	Dallas
Mantz, James Franklin B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Slatington
Marsh, James Sutherland B.S. in M.E., Lehigh.	Bethlehem
Martin, Mary Marcia	Bethlehem
Martucci, Carmen James A.B., Moravian.	Bethlehem
McHugh, Helen M. B.A., New Jersey State Teachers College (Montclair).	Chatham, N.J.
McLay, Thomas Atkinson	Bethlehem
McMichael, Maude Barr B.A., Pittsburgh; Litt.M., Pittsburgh.	Allentown
McMurry, Howard Vernon B.S., Pennsylvania State; Sc.D., Massachusetts Institute of Technology.	Palmerton
Mengel, John Franklin B.S. in M.E., Lehigh.	Bethlehem
Meyer, Doris Clark B.A., Rice Institute.	Emmaus
Michael, Charles Preston B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg).	Allentown
Miller, Leola Smith	Easton
Miller, Richard Krause Ph.B., Muhlenberg.	Allentown
Mills, Bittles B.S. in Ind. Adm., Illinois.	Bethlehem
Mindlin, Morris B.A., Lehigh; LL.B., Pittsburgh.	Bethlehem
Mixsell, Josephine Cumings	Bethlehem
Moore, Mildred Irma	Bethlehem
Morris, Lois Jane B.A., Pennsylvania State.	Easton
Moyer, Doris Nase B.A., Goshen.	Blooming Glen
Moyer, Irene Mae	Allentown
Moyer, Marie Meyers B.A., Goshen.	Souderton
Moyer, Miriam Detweiler A.A., Hesston.	Perkasie
Moyer, Rachel E. B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Mullen, James Edward B.S., St. Joseph's (Pennsylvania).	Pennsburg
Murnin, Bridget Mary B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Vandling

Murphy, John Francis, Jr.	Bethlehem
Naratil, John Stephen	Palmerton
Neff, Alfred Dewey, Jr. A.B., Moravian.	Bethlehem
Neff, Esther Kathryn B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Nevins, John B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Hokendauqua
Nickum, Rachael Lehr B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Fullerton
O'Donnell, Nellie K. Ph.B., Muhlenberg; B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg).	Eckley
O'Hara, Joseph John	Scranton
Onila, John	Bethlehem
Ott, Robert Emery A.B., Lafayette.	Easton
Paul, Betty Renée B.S. in Ed., Pennsylvania State Teachers College (Bloomsburg).	Allentown
Pearsol, Bette May	Kunkletown
Perkins, Horace Pembroke	Bethlehem
Peterkin, Helen Webster A.B., Wellesley; A.M., Columbia.	Hellertown
Piff, William B.A., Muhlenberg.	Allentown
Powell, Florence Ruth	Easton
Preston, Amy E.	Bethlehem
Rajcok, Paul George B.S. in I.E., Lehigh.	Bethlehem
Randall, William Daniel A.B., Moravian.	Bethlehem
Reimers, George Irving B.S., California Institute of Technology.	Allentown
Remmel, Christine Kathryn	Allentown
Rhoads, Ralph Henry B.S. in I.E., Lehigh.	Allentown
Rhodes, Donald Everett B.S., Pennsylvania State.	Bethlehem
Rice, Margaret Irene	Bethlehem
Rich, Herbert William E.M., Lehigh.	Easton
Richardson, Marilyn Alice A.B., Moravian College for Women.	Allentown
Rigler, Marilyn B.S. in Ed., Ohio University.	Brooklyn, N.Y.
Riley, Ann B.F.A., Pratt Institute.	Bethlehem

Riley, Lila Stevenson A.B., Cornell; A.M., Illinois.	Bethlehem
Rodda, John Landon B.S., M.S., Rutgers.	Palmerton
Roffé, Leo Heltman B.S., Moravian.	Bethlehem
Rosati, Susan Bennette	Bethlehem
Rosenberger, Paul William	Hellertown
Roth, Charles Allen B.A., Lehigh.	Allentown
Roth, Margenett Hartzell B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Roth, Mary Catherine A.B., Muhlenberg.	Allentown
Roth, Mary Elizabeth B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Rush, Springer Todd	Bethlehem
Ruth, Evelyn Velma A.B., Ursinus.	Hellertown
Ruth, Paul Isaac B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Allentown
Rutkoski, Stanley	Allentown
Sachs, Rudolph B.S. in M.E., Alabama; M.S., Columbia.	Allentown
Salzenberg, Shirley Ann	Bethlehem
Sandwick, Jessie Ramsay A.B., Moravian College for Women.	Easton
Schaffer, Arthur Frederic	Bethlehem
Schaffer, Mary Josephine B.S., Ursinus.	Bethlehem
Schantz, Ruth Reese B.S., Moravian College for Women.	Emmaus
Schneider, Peter Paul Ph.B., Muhlenberg.	Northampton
Schobel, Jack	Bethlehem
Schrader, Hypotin	Hellertown
Schreiner, John Whiting, Jr.	Allentown
Schuchard, Hans Karl B.S., A.M., Ph.D., Pennsylvania.	Bethlehem
Schuessler, Marjorie Louise B.A., Moravian College for Women.	Easton
Scott, Edith Winkler B.S., Bucknell.	Bangor
Seals, Richard Bell B.A., M.A., Lehigh.	Bethlehem
Seems, Roy Leland A.B., Moravian; B.D., Moravian Theological Seminary.	Canadensis
Segal, Helen	Allentown

Serfass, Mabel Dowling A.B., Cedar Crest.	Bethlehem
Shafer, Richard Charles B.S. in M.E., Lehigh.	Allentown
Shakeshaft, Harold Ivan, Jr.	Bloomsbury, N.J.
Shipe, Olivia Hilda B.S., Beaver.	Bethlehem
Shoenberger, Evelyn Prutzman B.A., Pennsylvania State.	Allentown
Shultz, Elizabeth Ruth B.S. in Ed., Pennsylvania State Teachers College (Indiana).	Hershey
Sieger, Jarrold	Allentown
Singer, Russell Edwin	Bloomsbury, N.J.
Smail, Margaret Barton	Bethlehem
Small, Edward Nicholas B.S. in Bus. Adm., Lehigh.	Bethlehem
Smart, Patricia	Easton
Smith, Dorothy Mae	Allentown
Smith, Emily Louisa B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg).	Pocono Lake
Smith, Helen Miller B.S. in Phys. Ed., Boston University.	Phoenixville
Smith, Ruth Leanore B.S., Elmira; M.A., Columbia.	Bethlehem
Snyder, Richard John A.B., Franklin and Marshall.	Palmerton
Snyder, Suzanne Olivia A.B., Cedar Crest.	Allentown
Sokal, Helen Anne	Bethlehem
Spanitz, John Roger	Bath
Speck, Norton Lewis B.S., Syracuse.	New York, N.Y.
Stahl, Anna Mae	Bangor
Stahl, Ruth Rolin B.S. in Ed., Pennsylvania State Teachers College (Lock Haven).	Bethlehem
Stecker, Mary Louise A.B., Wilson	Easton
Steele, Robert Oliver	Palmerton
Stephen, Charles Henry B.S. in Ed., Pennsylvania State Teachers College (Kutztown).	Emmaus
Stout, Mary Catherine A.B., Georgia.	Phillipsburg, N.J.
Strametz, Alice Estelle B.S. in Ed., Pennsylvania State Teachers College (West Chester).	Allentown
Strauss, Robert B.S., Cornell.	Allentown
Strausser, Jean Louise B.S. in Mus. Ed., Susquehanna.	Mt. Carmel

Swayne, Carol Frazee B.S. in Ed., New York State College for Teachers (Buffalo); M.S., Syracuse.	Bethlehem
Sweger, Stanley Mervin	Easton
Taylor, Kendrick Cashman B.S., Pennsylvania State.	Bethlehem
Texter, Robert Ernest	Perkasie
Townsend, John Platt B.S. in M.E., Lehigh.	Glen Ridge, N.J.
Tretheway, Florence Leona	Bethlehem
Trojan, John Joseph	Lansford
Trux, Leila Mary	Easton
Ungurian, Emmeline Stephanie A.B., Moravian College for Women.	Bethlehem
VanFleet, Atlee Messler	Allentown
Vaux, George B.S., Haverford; D.I.C., University of London.	Bryn Mawr
Velesz, Frank Joseph A.B., Western Michigan; A.M., Chicago.	Bethlehem
Velesz, Mary Jane Theresa	Bethlehem
Wagner, Roger Russell	Bethlehem
Walker, Eleanor Laura B.S. in Home Ec., Pennsylvania State.	Allentown
Ward, Evelyn Davidson B.A., Richmond.	Bethlehem
Waring, Robert Kerr B.S., Virginia Military Institute; Ph.D., Johns Hopkins.	Palmerton
Webber, Harry Walter, Jr. B.A., M.A., New Jersey State Teachers College (Montclair).	Washington, N.J.
Weikel, Dorothy C.	Bethlehem
Weitz, Anne Moore A.B., North Carolina.	Bethlehem
Werley, Jean Helen B.S., Cedar Crest.	Egypt
Wertman, Dawn Eckert	Bethlehem
Wile, Lawrence Leslie B.S. in Ed., Pennsylvania State Teachers College (East Stroudsburg); M.A., New York University.	Cresco
Wilhelm, Clemence Dion B.S., Cedar Crest.	Bethlehem
Willard, Elise Krassa B.Ed., Brown.	Bethlehem
Williams, Armon Mendelssohn A.B., Muhlenberg.	Bangor
Williams, James Ernest	Easton
Wilson, Charles David B.S. in E.E., Northwestern.	Fond du Lac, Wis.
Wilson, Miriam Rebecca	Emmaus

Wilt, Elmer Delaney B.S., Swarthmore.	Bethlehem
Windish, John Joseph B.A., Lehigh.	Bethlehem
Wood, Marion E.	Bethlehem
Younger, Robert Edward, Jr. B.E., Yale.	Bethlehem
Zasinas, Virginia A. B.S., Moravian College for Women.	Easton

SUMMARY OF STUDENT REGISTRATION

Students in the University

Summer 1948, Fall and Spring 1948-1949

Graduate Students, Summer Sessions	204
Undergraduate and Adult Education Students, Summer Sessions	939
Total, Summer Sessions	1143
Graduate Students, Fall and Spring	432
Undergraduate Students, Fall and Spring	2992
Adult Education Students, Fall and Spring	301
Total less Duplications, Fall and Spring	3707
Total less Duplications, Summer, Fall, and Spring	3975

Students in Undergraduate Curricula

Fall and Spring 1948-1949

Curriculum	Seniors	Juniors	Sophomores	Freshmen	General Coll. Division	Total
Arts and Science	88	140	115	142	—	485
Business Administration	203	189	180	128	—	700
Chemical Engineering	66	71	66	78	—	281
Chemistry	16	18	15	22	—	71
Civil Engineering	43	37	36	42	—	158
Electrical Engineering	87	92	72	82	—	333
Engineering Physics	20	20	18	34	—	92
Industrial Engineering	115	83	51	44	—	293
Mechanical Engineering	123	100	93	89	—	405
Metallurgical Engineering	23	29	22	32	—	106
Mining Engineering	5	11	13	26	—	55
General College Division	—	—	—	—	13	13
Total	789	790	681	719	13	2992

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

Fall and Spring 1948-1949

Alabama	5
Arizona	1
Arkansas	1
California	5
Colorado	3
Connecticut	55
Delaware	17
District of Columbia	16
Florida	8
Georgia	1
Illinois	17
Indiana	3
Iowa	2
Kansas	1
Kentucky	1
Maine	1
Maryland	37
Massachusetts	27
Michigan	12
Minnesota	2
Missouri	2
Montana	2
New Hampshire	3
New Jersey	757
New Mexico	1
New York	501
North Carolina	8
Ohio	39
Oklahoma	2
Pennsylvania	2104
Rhode Island	1
South Carolina	2
Texas	2
Vermont	3
Virginia	10
West Virginia	8
Wisconsin	5

Wyoming	1
Brazil	1
Burma	3
Canada	4
Canal Zone	1
China	7
Cuba	1
Czechoslovakia	1
Denmark	1
Dutch West Indies	1
Germany	1
Greece	1
Hawaii	2
India	6
Korea	1
Norway	1
Pakistan	1
Philippine Islands	1
Spain	2
Switzerland	2
Turkey	1
Venezuela	2
	3707

INDEX

Accelerated Program, 47
Accounting, 63, 84, 133ff
Actuarial Science, Preparation for, 71
Administrative Officers, 31ff
Admission, 37ff, 123f, 126, 127f
Adult Education Program, 269
Advanced Standing, 41f, 127
Alpha Kappa Psi Medallion, 291
Alumni Association, 295
Alumni Memorial Building, 303
Alumni Prizes, 287
American Chemical Society Award, 291
American Institute of Chemists Medal, 291
American Society of Civil Engineers Prize, 291
American Society of Mechanical Engineers Prize, 291
Anticipatory Examinations, 4, 42, 44
Arboretum, 306
Art Gallery, 274
Arts and Engineering, 55f, 96
Arts and Science, College of, 49ff
Astronomy, 71, 220
Astronomical Observatory, 300
Athletics, 259ff
Baccalaureate Sunday, 310
Bacteriology, 59f, 136ff
Baldwin Fellowship, 312
Band, 33, 242
Biology, 59f, 136ff
Blake Memorial Prizes, 289
Board of Trustees, 5f
Books, Special Collections of, 273f
Botany, 59, 136ff
Brink Fellowship, 313
Buildings and Grounds, 33, 296ff
Business Administration and Industrial Engineering, 85f
Business Administration, College of, 77ff
Business Administration, Curriculum in, 82ff
Business Law, 136
Byllesby Fellowship, 312
Cafeteria, 47
Calendar, 3f
Candidacy for Degree, Notice of, 307
Carson Prize, 286
Chandler Chemistry Laboratory, 296
Chandler Prizes, 287
Chapel Services, 270
Chemical Engineering, 98f, 142, 149ff
Chemistry, 60, 100f, 142ff
Chemistry Building, 296f
Christmas-Saucon Hall, 300
Civil Engineering, 102f, 152ff
Class Honors, 309, 334ff
College Board Examinations, 39f
Committees, Faculty, 30
Committees, Special Standing, 34
Commencement Exercises, 310, 316ff
Comprehensive Examinations, 58, 129, 130
Conservation, Major in, 61
Cooperative Research, 314f
Coppée Hall, 300
Cortright Scholarship, 282
Counseling Service, 33, 272
Courses of Instruction, 131ff
Course Societies, 292f
Coxe Memorial Collection, 273
Coxe Memorial Fund, 284
Coxe Mining Laboratory, 299
Credit Hours, 133, 308
Cups, Scholarship, 290
Davis Scholarship, 284
Degrees, Application for, 125, 307f
Degrees, Candidacy for Advanced, 123, 125, 126, 127f
Degrees Conferred
  February 1948, 316ff
  June 1948, 320ff
  October 1948, 328ff
Degrees, Special Regulations Concerning, 125, 307
Description of Courses, 131ff
Diefenderfer Award, 291
Dispensary Service, 271
Distribution Requirements, College of Arts and Science, 56f
Doctor of Philosophy
  Fields for Major, 123
  Requirements for, 127ff
  (See also statements preceding graduate courses offered by the several departments.)
Dormitories, 46, 301f, 307

Dravo House, 301
Drawing, Engineering, 152
Drawing, Freehand, 188
Drinker House, 302
Drown Memorial Hall, 302f
duPont Prize, 287
Economics, 62, 84, 159ff
Economic Statistics, 84f, 135
Education, Adult, 269
Education Building, 306
Education, Courses in, 162ff
Education, General, Program in, 269f
Education, Major in, 63, 165
Electrical Engineering, 104f, 169ff
Electrical Engineering Prize, 287
Emery Scholarship, 282
Employment, Part-time, 274f
Endowment of Followships, 315
Endowment of Scholarships, 285
Engineering, Arts and, 55f, 96
Engineering, College of, 87ff
Engineering Curricula, Undergraduate, 98ff
Engineering Geophysics, 144ff, 240f
Engineering Physics, 106f
English, 63f, 174ff
Eta Kappa Nu Prize, 291
Eta Sigma Phi Prize, 290
Entrance Requirements, 37ff, 123
Examinations, Anticipatory, 4, 42, 44
Examinations, Comprehensive, College of Arts and Science, 58
Examinations, Final, Ph.D., 130
Examinations for Admission, 39f
Examinations, General, Ph.D., 129
Examinations, Make-Up, 4, 43f
Examinations, Physical, 271
Examinations, Special, 4, 42, 44
Expenses, Estimate of, 45
Faculty, Arts and Science, 51ff
Faculty, Business Administration, 79
Faculty Committees, 30
Faculty, Engineering, 89ff
Faculty, Graduate, 119ff
Faculty, Summer Sessions, 27f
Faculty, University, 7ff
Fees and Expenses, 43ff, 124f
Fellows, 1948-1949, 26f
Fellowships, 311ff
Fellowships, Endowment of, 315
Finance, 62f, 85, 185ff
Financial Aid, 275ff, 311ff
Fine Arts, 65, 187ff
Founder's Day, 310, 328ff, 334ff, 338ff
Fraternities, Honorary, 292ff
Fraternities, Social, 294
Frazier and Ringer Fund, 284f
French, 74, 254ff
Fritz Engineering Laboratory, 32, 298
Frye Fellowship, 313
General College Division, 268f
General Education, Program in, 269f
General Study, 94f
Geology, 65f, 189ff
Geophysics, Engineering, 114ff, 240f
German, 66, 194ff
Goodman Prize, 289
Gotshall Scholarships, 285
Government, 68f, 206f
Grace Hall, 301
Grades, 308
Graduate Scholarships, 285
Graduate School, 117ff, 345ff
Graduation Honors, 309, 332ff
Graduation, Requirements for, 54, 56ff, 82ff, 95, 98ff, 125ff, 174f, 261, 307f
Greek, 60f, 66f, 196ff
Haines Scholarship, 282
Half-Semester, Summer, 47, 345ff, 376ff
Health Center, 306
Health Service, 33, 270f, 306
History, Courses in, 197, 199ff, 211, 212f
History, Major in, 67ff, 203
History of Lehigh University, 35f
Honorary Societies, 292ff
Honors, 58, 308f, 332ff
Hoppes Fellowship, 313
Horn Prize, 287
Horner Fellowship, 313
Industrial Engineering, 108f, 220, 226ff
Industrial Engineering and Business Administration, 85f
Industrial Research Appointments, 314
Inspection Trips, 95f
Institute of Research, 28f, 311ff
Intercollegiate Athletics, 259f

International Relations, 69f, 208ff
Intramural Sports, 260f
Italian, 256
Journalism, 64f, 183ff
Lamberton Hall, 47, 304
Language Requirements
  Arts and Science, 37, 56f
  Business Administration, 83
  Graduate School, 128f
Late Payment Fee, 44
Late Registration Fee, 44
Latin, 61, 70, 210ff
Law, Preparation for, 55, 67ff, 81
Law, Courses in Business, 136
Lehigh Collection, 273
Lehigh Field, 304
Lehigh University, General Description, 35f
Lehigh University, History of, 35f
Library, 32, 272ff, 300f
Linderman Library, Lucy Packer, 300f
Living Quarters, 46, 301f, 307
Loan Funds
  For Graduates, 285
  For Undergraduates, 280f, 284f
Major Sequences
  Arts and Science, 57, 59ff
  Business Administration, 81f, 84f
  Engineering, 98ff
Marketing, Major in, 85
Master's Degrees
  Fields for Major, 122f
  Requirements for, 125ff
  (See also statements preceding graduate courses offered by the several departments.)
Mathematics, 70f, 214ff
Mechanical Engineering, 110f, 220ff
Mechanics, 157ff
Medicine Preparation for, 55, 59
Mercur Scholarship, 281
Metallurgical Engineering, 112f, 228ff
Midyear Commencement, 310, 316ff, 332
Military Science and Tactics, 234ff
Mining Engineering, 114ff, 238ff
Mueller Scholarship, 284
Music, 241f
New Jersey Zinc Company Fellowship, 312
Nostrand Scholarship, 281
Organizations, Student, 292ff
Packard Laboratory, 304ff
Packard Fellowship, 312
Packer Hall, 296
Packer Memorial Church, 32. 300
Part-time Employment, 274f
Phi Beta Kappa, 292
Philosophy, 71f, 243ff
Philosophy, Doctor of, 122f, 127ff
Phi Sigma Kappa Scholarship Cup, 290
Physical Education, 259ff
Physical Examinations, 44, 271
Physics, 72, 106f, 245ff
Physics Building, 297
Pi Tau Sigma Prizes, 290
Placement Bureau, 33, 274
Political Science, 68f, 206f
Portuguese, 257
Postdoctoral Work, 130
Power House, 297
President's Fund, 285
Price House, 302
Prizes, 286ff, 337ff
Professional Engineering Degrees, 96f
Psychology, 72ff, 250ff
Public Health, Preparation for. 55, 59f
Public Relations, Department of, 33
Public Service, Preparation for, 55, 62, 67ff, 74
Public Speaking, 181ff
Publications, Student, 183, 295
Quier Prize, 289f
Quinn Scholarship, 282
Refunds of Fees, 44
Regional Scholarship, 277ff
Register of Students, 343ff
Registration, 3f, 42, 44, 124
Registration, Fee for Late, 44
Religion, 253f
Religious Observances, 270
Requirements for Degree, Last Day for Completing, 307
Research Assistants, 28f
Research Assistantships, 314
Research Associates, 28
Research Fellowships, 311ff
Research, Institute of, 28f, 311ff
Research Professors, 28
Reserve Officers' Training Corps, 234f

Richards Collection, 274
Richards House, 302
Romance Languages, 74f, 254ff
Samuels Prize, 289
Sanitary Engineering, 102f, 154, 156
Sayre Observatory, 300
Sayre Park, 306
Scholarship Cups, 290
Scholarship Loans, 285
Scholarships
  Graduate, 285
  Undergraduate, 275ff
Scholarships, Endowment of, 285
Scholarships, Holders of, 1948-1949, 26f
Scholastic Aptitude Tests, 39f
Scranton Public High School Scholarships, 282f
Sigma Xi, 292
Sociology, 161f
Spanish, 75, 257f
Special Honors, 58, 309
Speech, 181ff
Statistics, Courses in, 135, 215, 216, 217
Statistics, Registration, 461ff
Student Chemistry Foundation, 313
Student Organizations, 292ff
Student Publications, 183, 295
Study, General, 94f
Summer Sessions, 27f, 47, 267f, 345ff, 376ff
Swimming Requirement, 261
Tau Beta Pi, 292
Tau Beta Pi Prize, 290
Taylor Field, 304
Taylor Gymnasium and Field House, 303f
Taylor House, 302
Theses, 125, 126f, 129f, 308
Thorne Fellowship, 313
Trustees, Board of, 5f
Trustee Scholarships, 279f
Tuition, 43f, 124f
Tuition Loans, 280f
Tuition Scholarships, 277ff
Ullmann Chemistry Laboratory. 296f
University Day, 310, 320ff, 332ff, 337f
University Faculty, 7ff
University Scholarships, 285
Unscheduled Work, 58
Vaccination Requirement, 42
Wagner Award, 286
Wilbur Engineering Laboratory, 297
Wilbur Prizes, 286
Wilbur Scholarship Prize, 286
Williams Fund, 284
Williams Hall, 297f
Williams Prizes, 287ff
Women Students, 37, 124, 269
York Scholarship, 283
Zollinger Scholarship, 283
Zoology, 59, 136ff